ELECTRICAL TIMES

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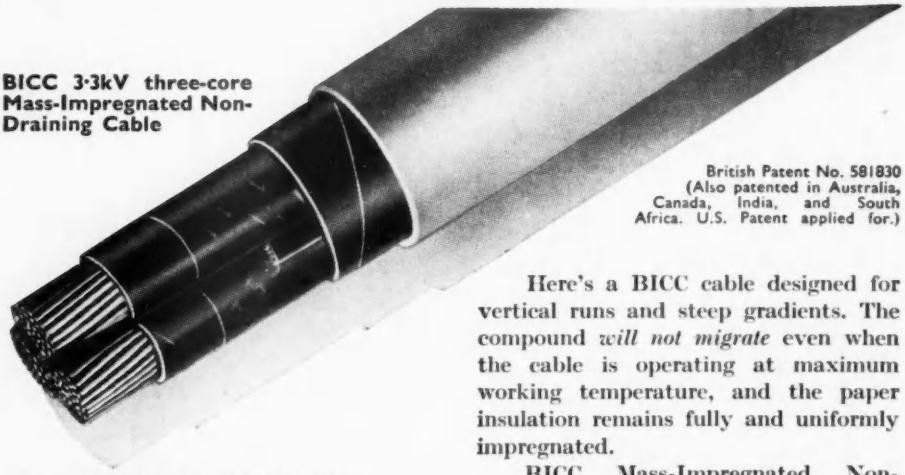

BICC 3·3kV three-core Mass-Impregnated Non-Draining Cable

British Patent No. 581830 (Also patented in Australia, Canada, India, and South Africa. U.S. Patent applied for.)

Here's a BICC cable designed for vertical runs and steep gradients. The compound *will not migrate* even when the cable is operating at maximum working temperature, and the paper insulation remains fully and uniformly impregnated.

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NO COMPOUND MIGRATION IN THIS CABLE

Further information is given in Publication No. 280V available on request.

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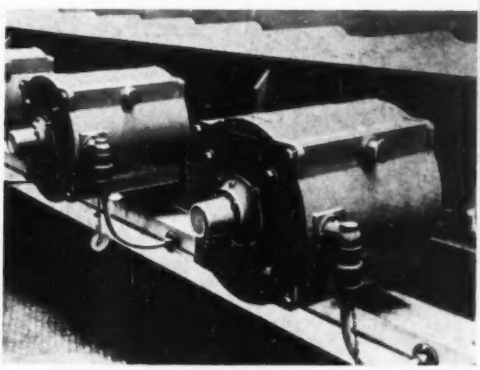

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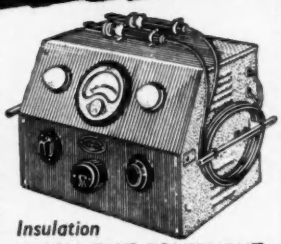

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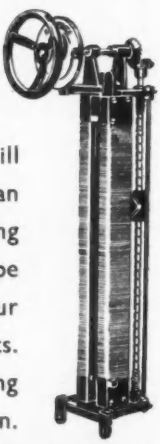

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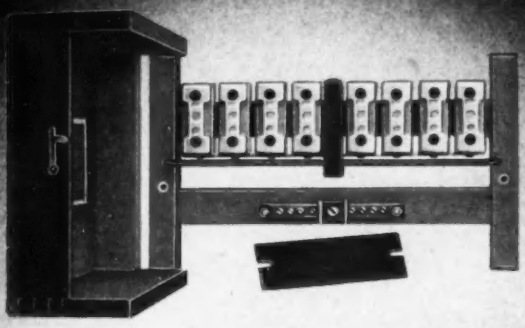

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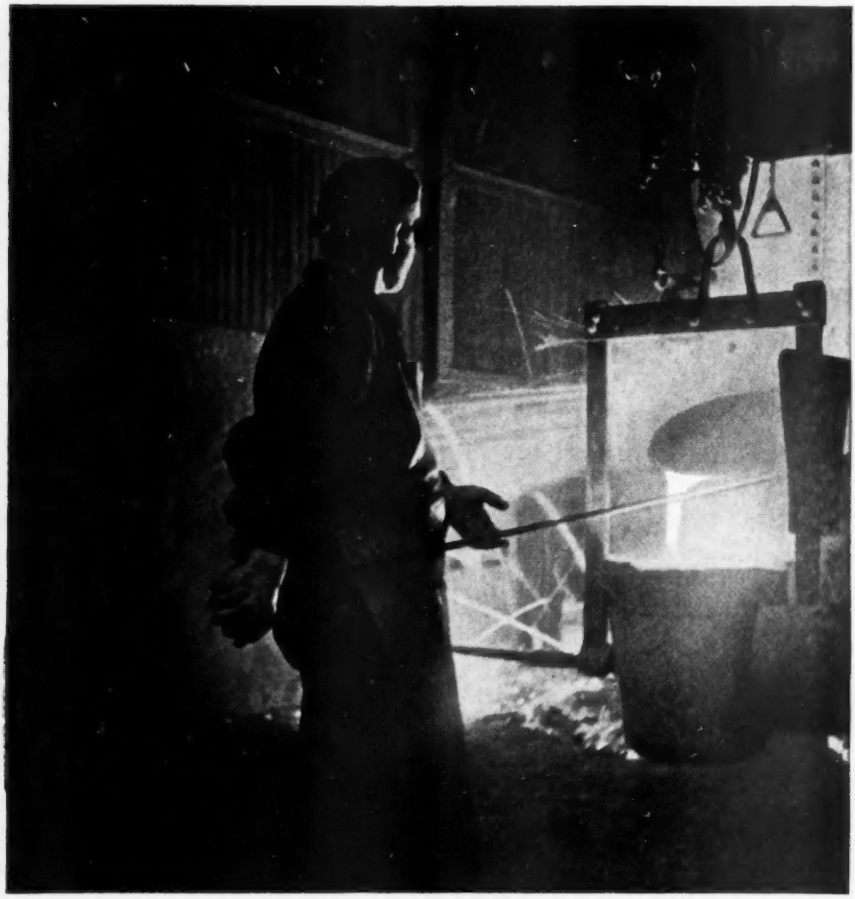

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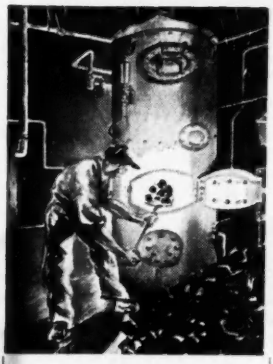
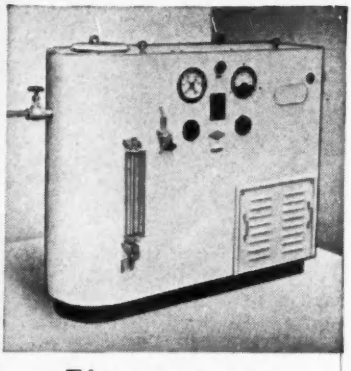


The hard way



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. . . in the past entailed not only the disadvantages of fumes and smoke from furnaces but the construction of chimneys, boiler-houses and capacious fuel storage occupying much extra space, also fuel elevators and mechanical stoking devices. But all that is done away with where the new AUTOLEC ELECTRODE STEAM RAISER is installed. Comparatively small, compact, clean, it needs no special housing building, no fuel storage or chimney. Automatically controlled, it produces maximum steam output in a few minutes starting cold, and maintains it without attention with 98% efficiency—the highest ever achieved.

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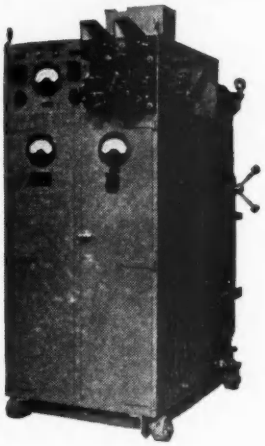

A typical DAVENSET Mercury Arc Rectifier with air-cooled transformer mounted behind cubicle

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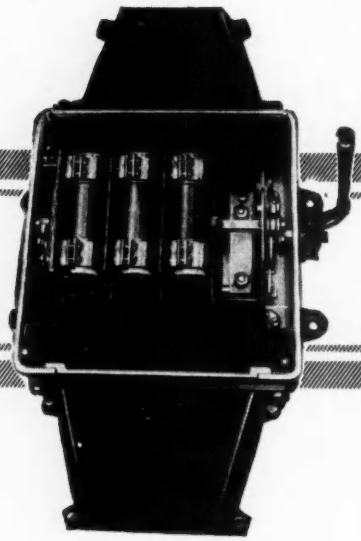

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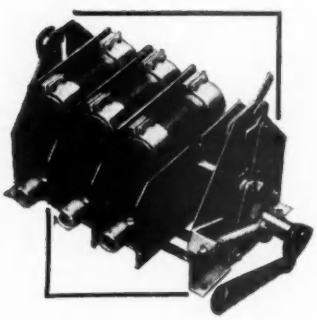

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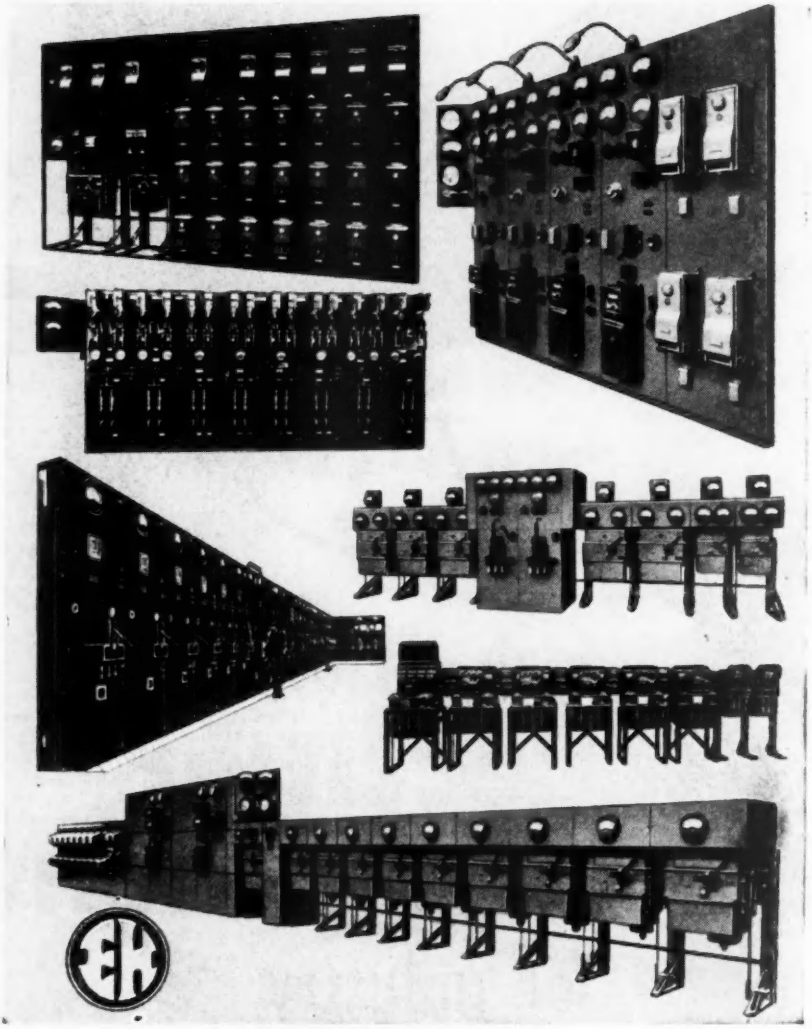

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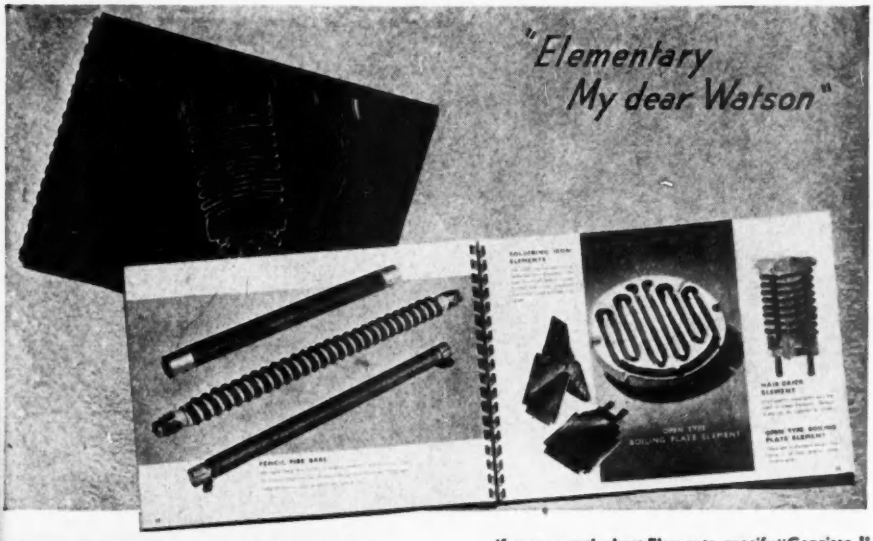

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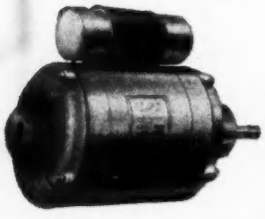

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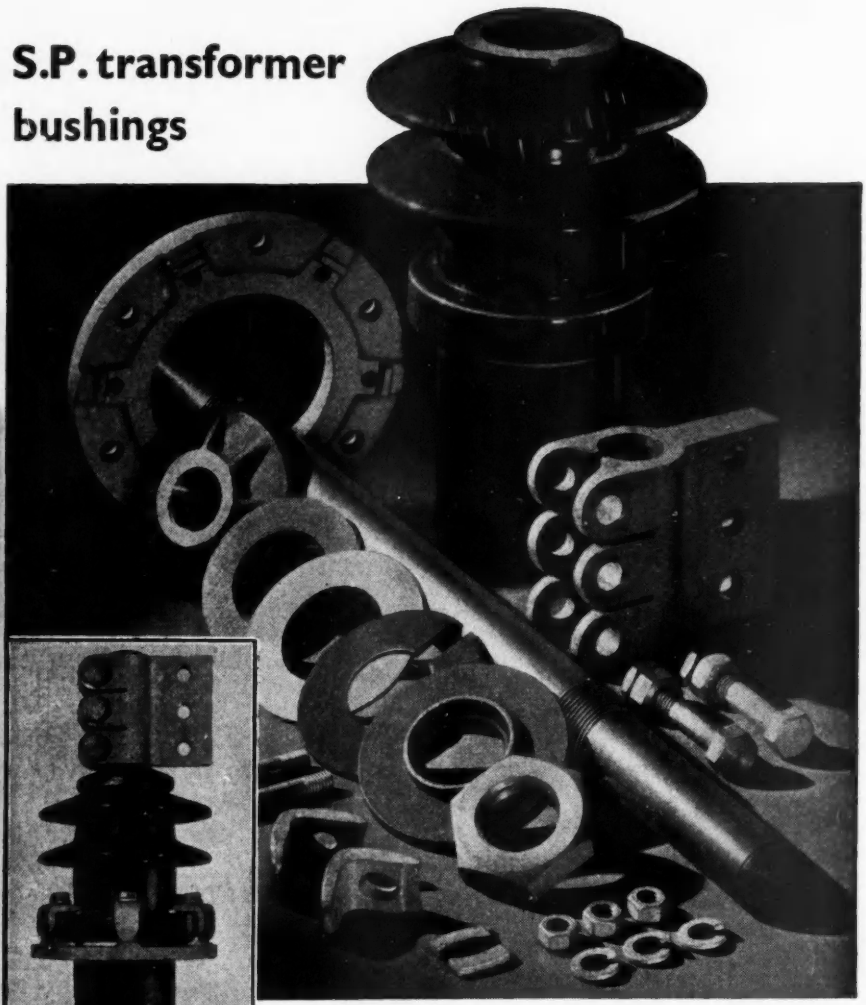

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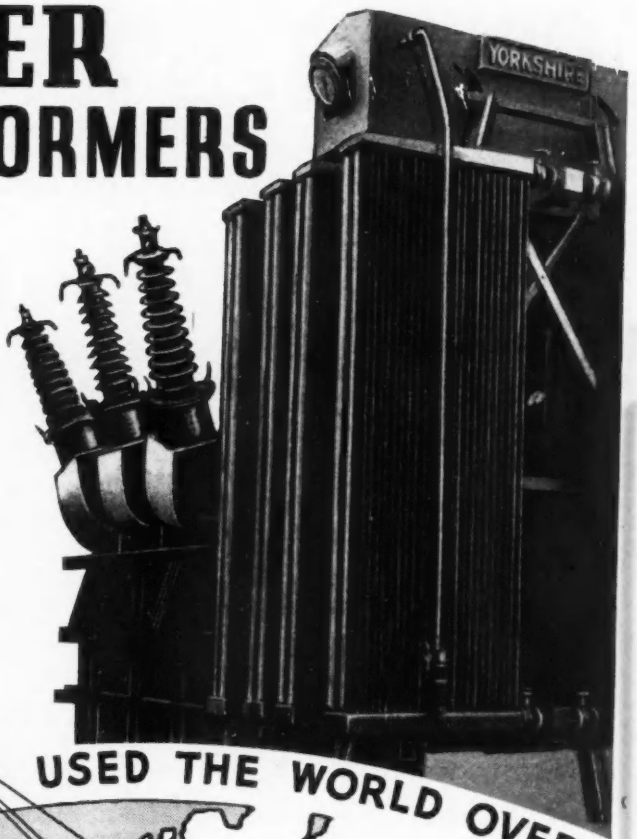

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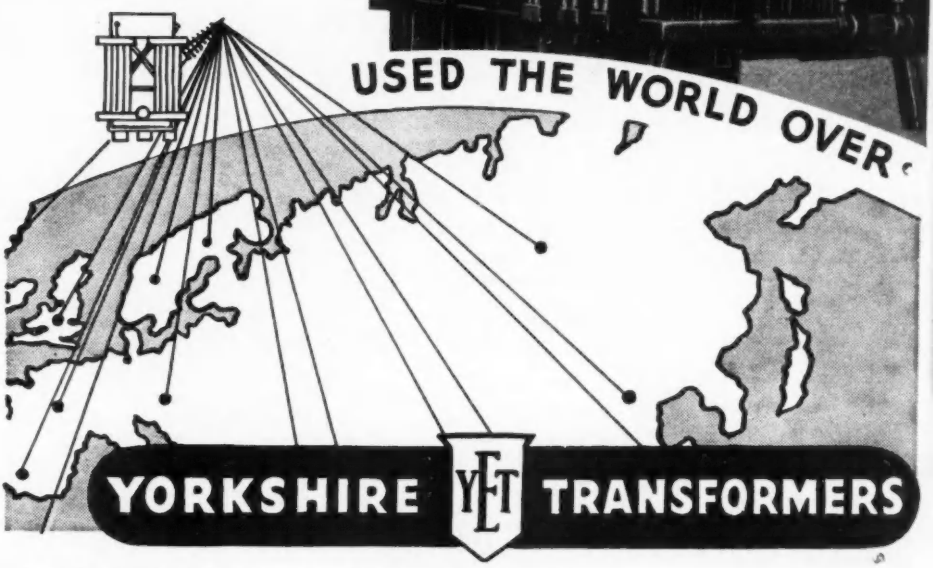

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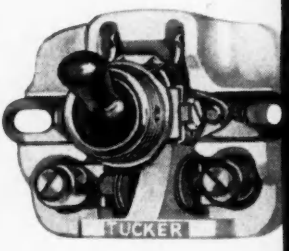

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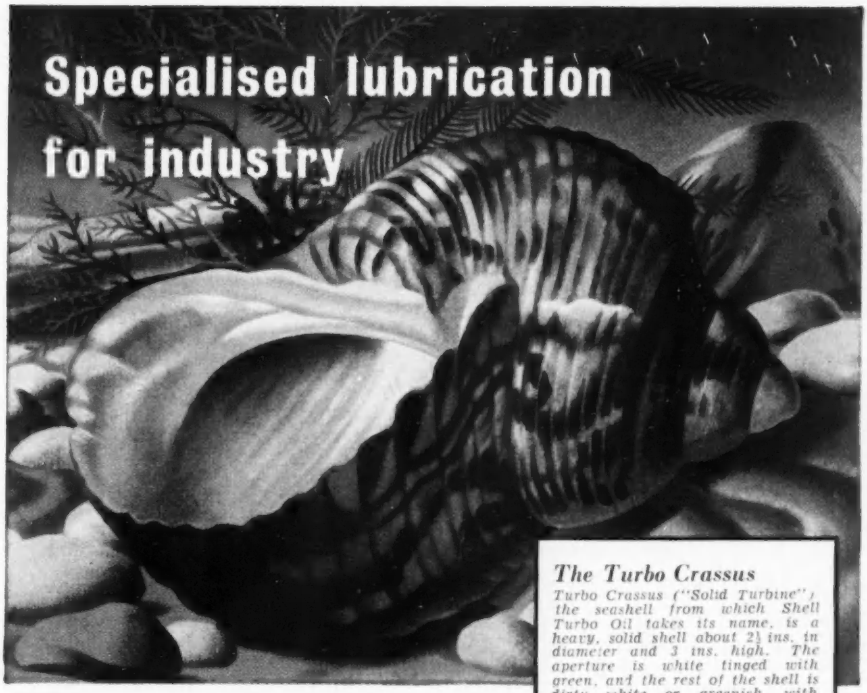

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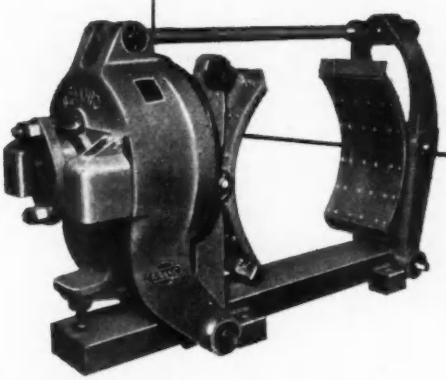

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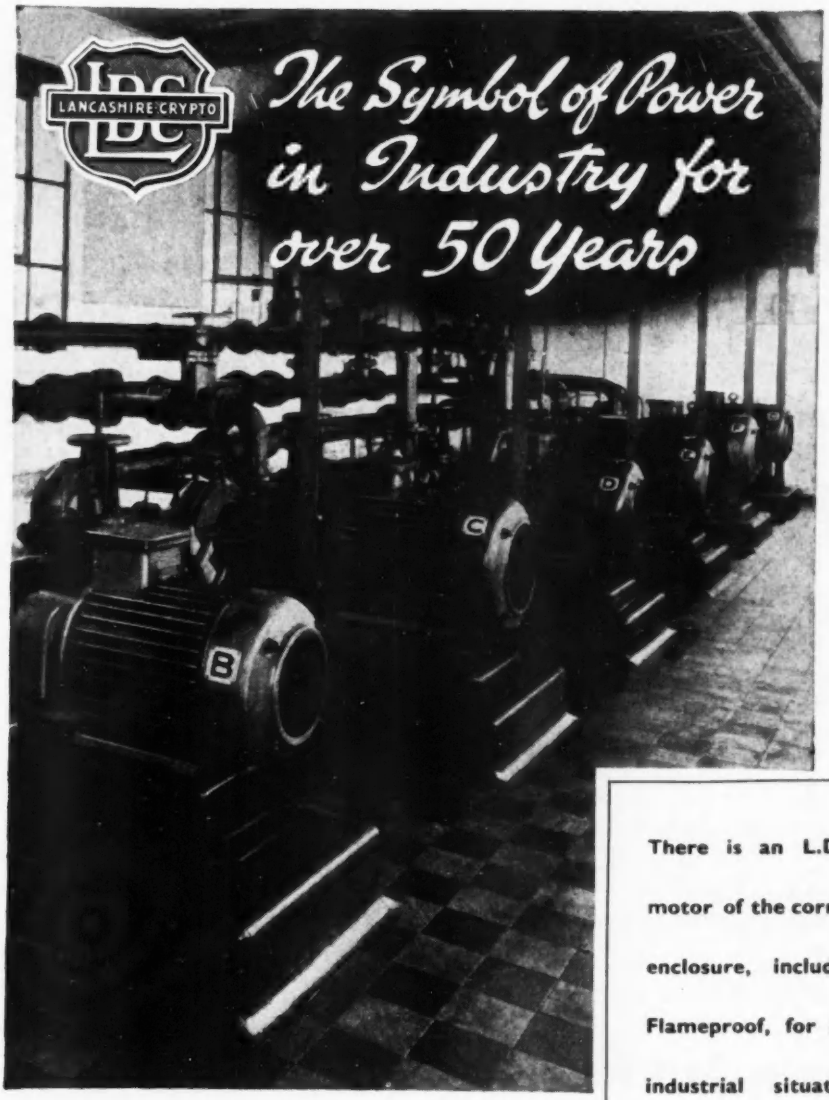

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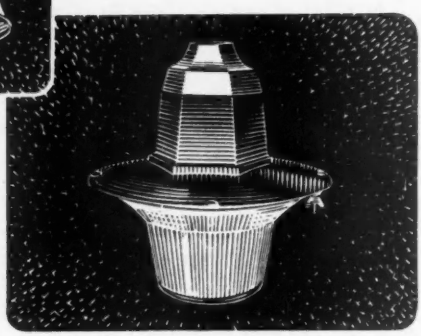

Street Lighting Fittings of outstanding design for all types of lamps; Tungsten; electric discharge; fluorescent lamps; industrial and commercial lighting fittings; vitreous enamelled reflectors of all types; cast iron, Watertight and Bulkhead fittings; street lighting columns; raising and lowering gear; switches.

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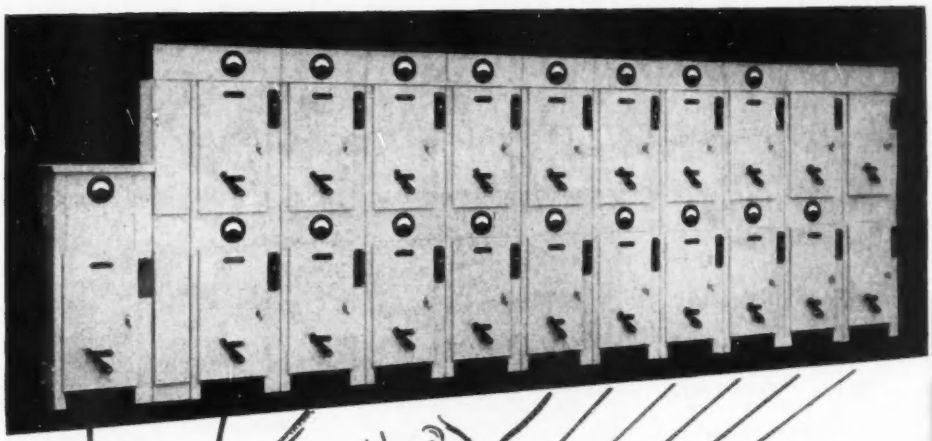

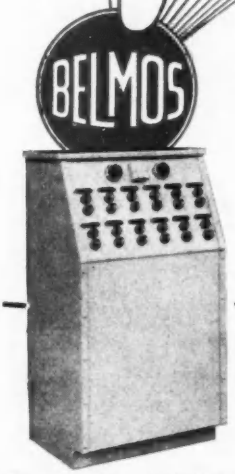

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A HIGH GRADE FITTING FOR GENERAL SERVICE

giving extensive service at low cost

THIS WORTHY ADDITION

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with control gear and starter switch

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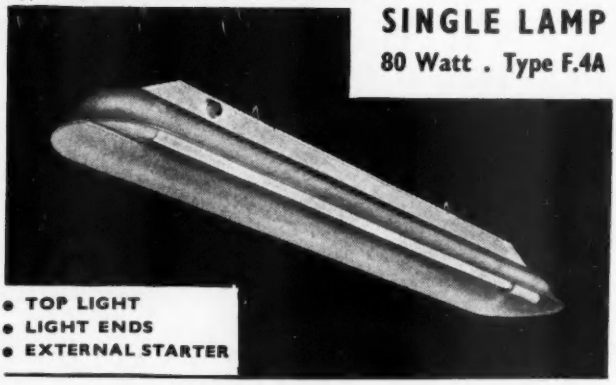

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Whenever light is needed . . .

The ELLIOTT LIGHTING CONTROLLER *switches on automatically*

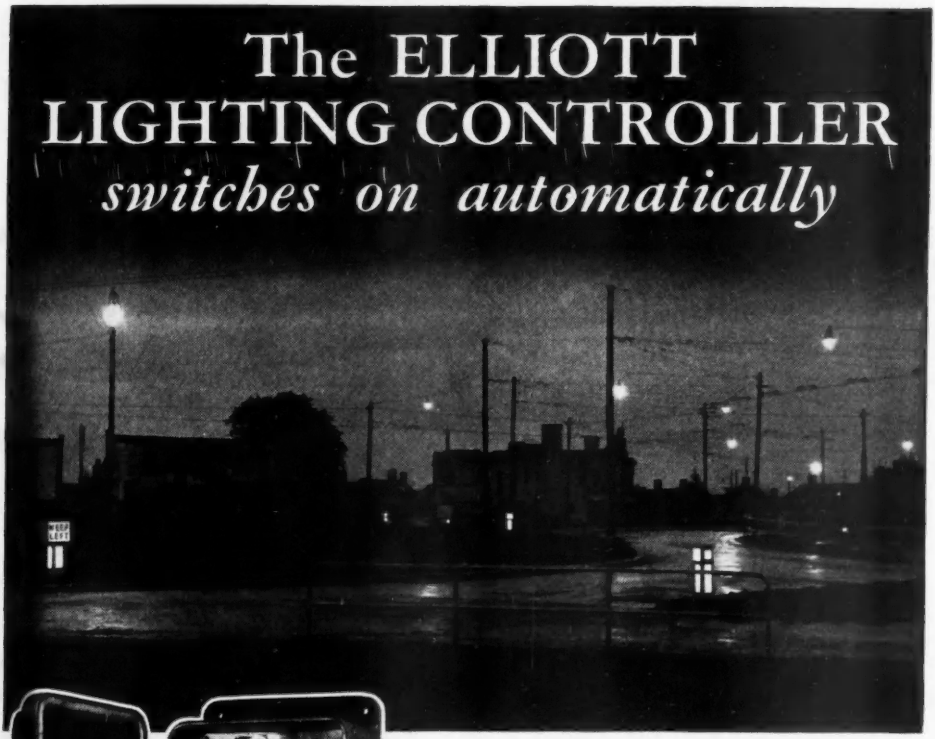

Photo by courtesy of Nottingham Corporation Lighting Committee

Reliability and simplicity are the keynotes of the Elliott Lighting Control System, which switches on whenever low light values occur, not only at night but also during daylight storms and fog. The system is particularly suitable for remote islands, crossings, etc., as it requires no routine maintenance or resetting. Operation is by means of a barrier-layer photocell and magnetic amplifier—*no valves are employed.*

The Elliott Lighting Controller has innumerable applications in industry, for FACTORY LIGHTING, HARBOUR and DOCK LIGHTING, RAILWAY YARDS, etc.

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Scarab *is a trade mark registered in Great Britain and in most countries of the world.*

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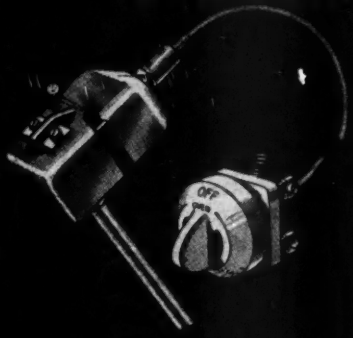

Some just happen; this one was designed . . . designed to cut out the snags . . . designed for minimum maintenance . . . designed (note the flexible drive) for easy fitting . . . designed – and made – by people who know.

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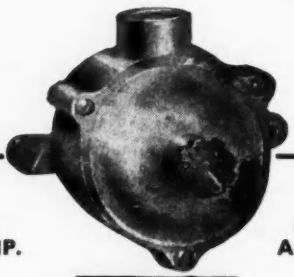

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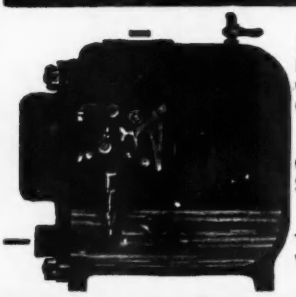

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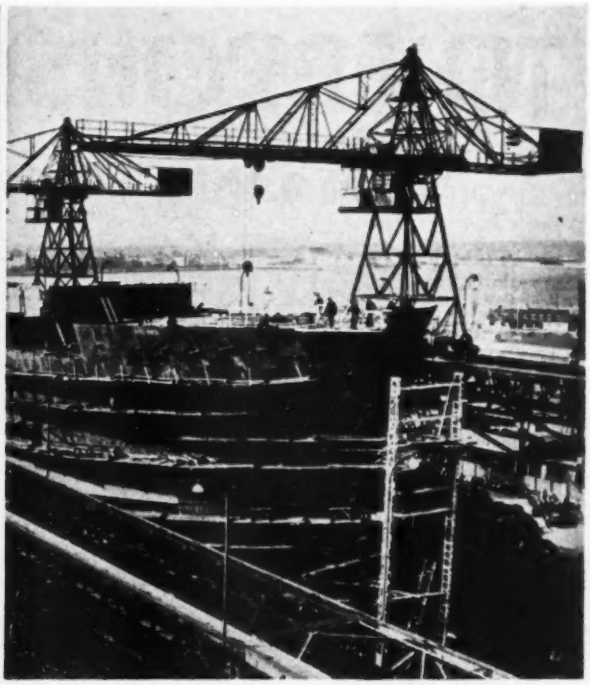
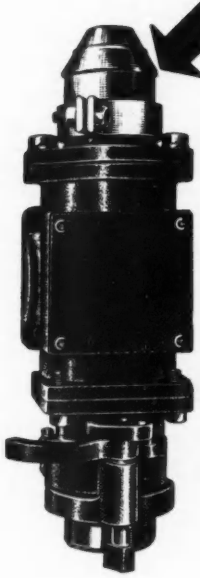
they've got to be tough . . .





It's a hard life for dockside plugs and sockets. They've got to be weatherproof as a duck's back and able to take handling that's really rough. Reyrolle 100-ampere and 250-ampere plugs and sockets can take it, even when the feeder-cable is sunk below the surface of the dock with the tee-off points accessible through dock-level manhole covers. When we construct heavy-duty equipment, it's tested to take more punishment than it's likely to get. The result is equipment upon which you can completely rely.

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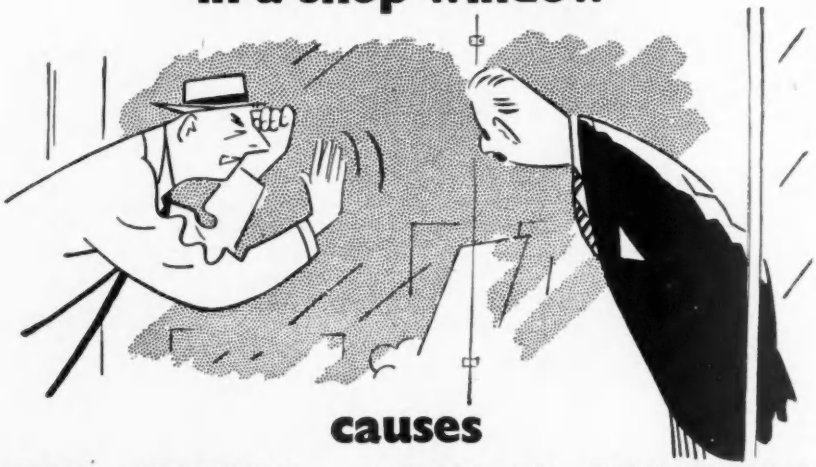
CRG 1SP

TENEBROUSNESS*

* *The state of being dark, or shadowed*

in a shop window



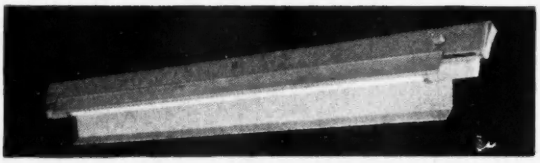
causes

POOR DISPLAY • LACK OF ATTENTION

LOST CUSTOMERS

NO MATTER how clever a window display may be, or how good the products featured, potential customers will not be stopped if the lighting is dull and uninspired. In the customer's mind an uninteresting window means an uninteresting shop. Philips fluorescent lighting does so much to improve a shop's reputation *and* its business — by providing warm, bright, pleasant light that enhances the appearance of any display.

For shop windows: the "Arden" fitting for Philips 80W. 5 ft fluorescent lamp, in conjunction with the "Weymouth" spotlight. Other suitable fittings are "Ashcroft" and "Aberford".



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Discharge water from dam outlets possesses considerable energy which, if not regulated, would severely damage the sides of the valley, river bed and concrete structures.

'ENGLISH ELECTRIC' cylindrical balanced discharge regulators destroy this energy by transforming the jet of water into a hollow cone.

The regulator is extremely compact, has simple control gear which can be manually or motor operated, while the balanced closing cylinder ensures that the valve is closed smoothly under all conditions.

'ENGLISH ELECTRIC' discharge regulators have various applications in hydro-electric and irrigation schemes; large numbers are installed and are giving satisfactory service in many parts of the world.

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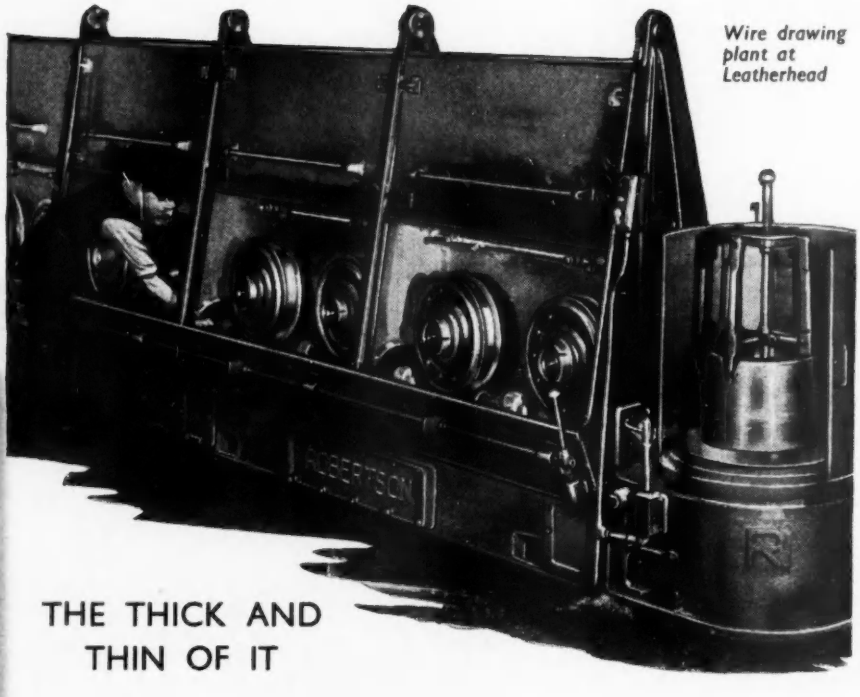

Wire drawing plant at Leatherhead

THE THICK AND THIN OF IT

Heavy-duty armoured giants or lissome V.I.R. Cable — there is a General Cable for every ordinary purpose. And when something unusual is needed, then we make a special cable to fulfil the requirements. One thing however *is* constant, and that is the high quality. *All* General Cables are as good as modern machinery, tended by conscientious craftsmen, can make them.

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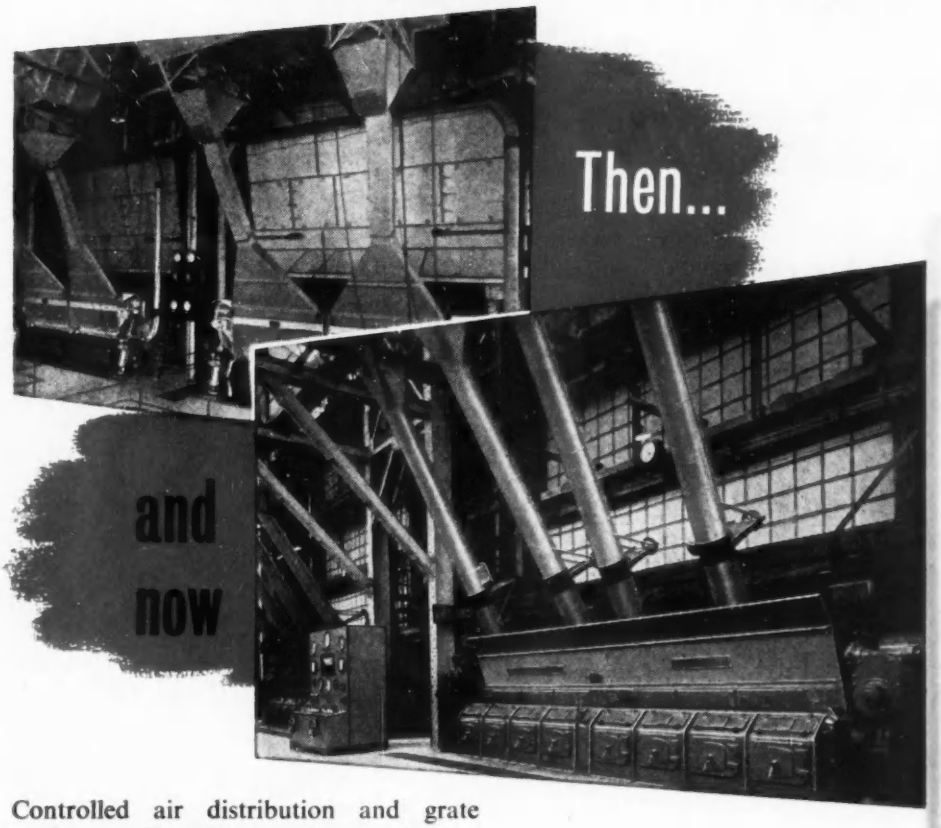
PROGRESS in "L" Stokers



Controlled air distribution and grate surface unaffected by metal growth have been leading features of Type "L" stokers from the start — but a number of other improvements have since been achieved. Modification of the louvre shape to obtain even better air distribution is one example. Much work has also gone into stepping up burning efficiency. Today, "L" stokers have a world-wide reputation and are used with almost every known design and size of water-tube boiler.

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that is

NOT TOO LATE!

Visible and audible warnings are given BEFORE a predetermined target load is exceeded, thus enabling effective action to be taken to reduce the load to the desired limit

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THE MAIN ADVANTAGES ARE

Immediate indications of the percentage of total load to be shed on warning.

Warnings are repeated at 5 minute intervals until load is adequately reduced.

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C & H

PEAK LOAD SUPERVISOR

Manufactured by

CHAMBERLAIN & HOOKHAM LTD.

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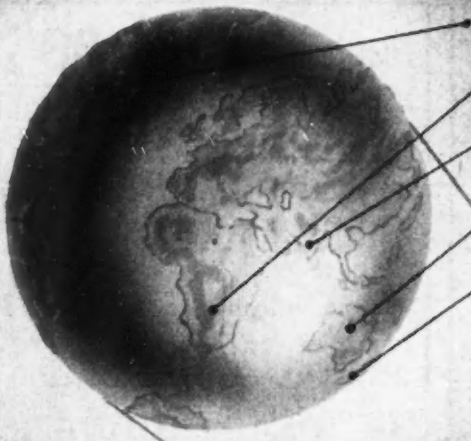

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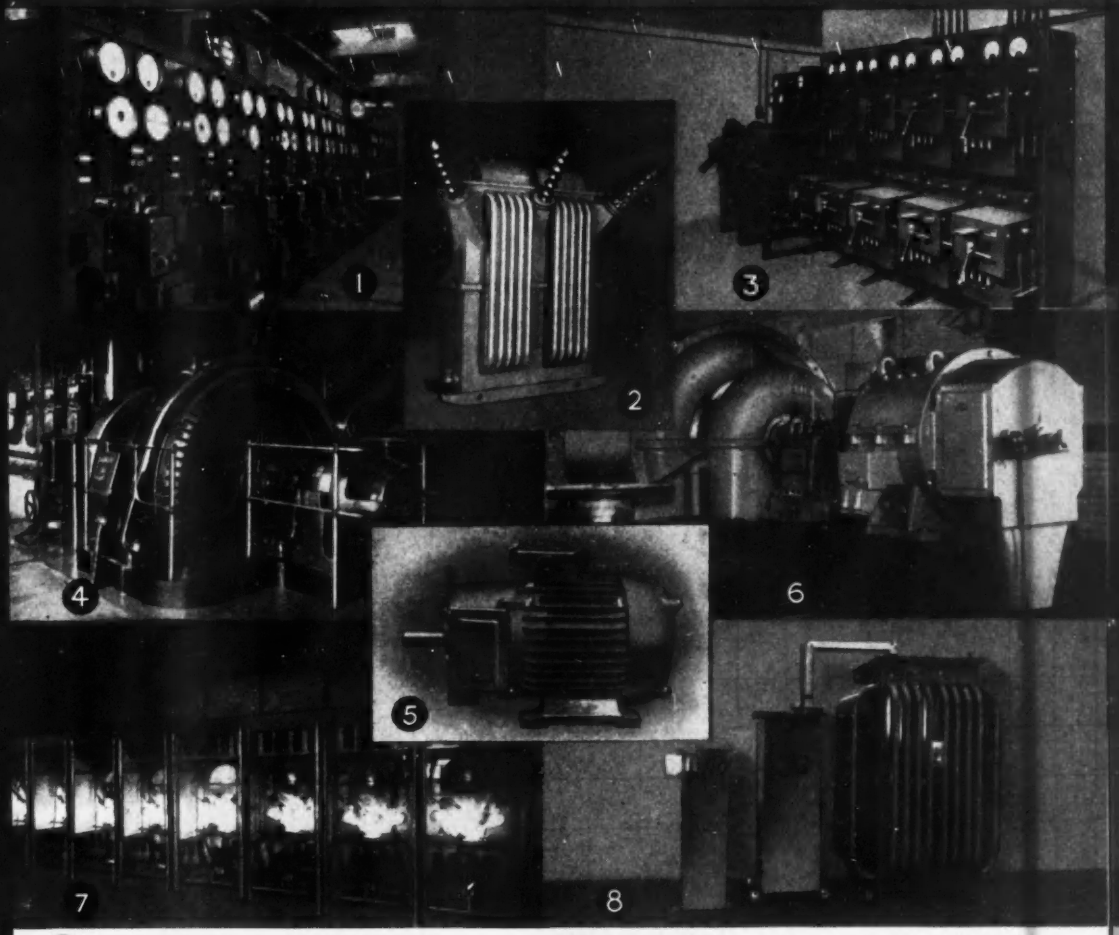

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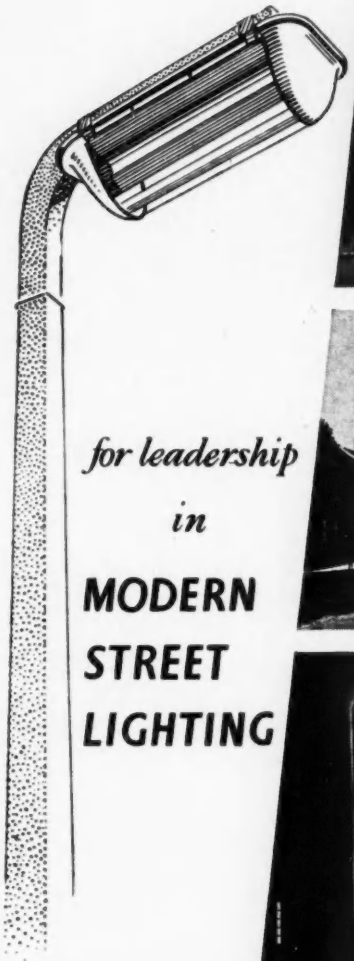

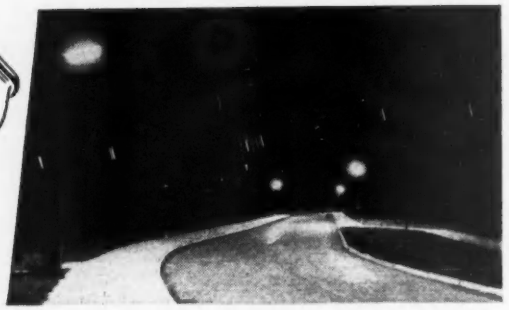

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by SIEMENS

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Let Henley Cables carry the Current

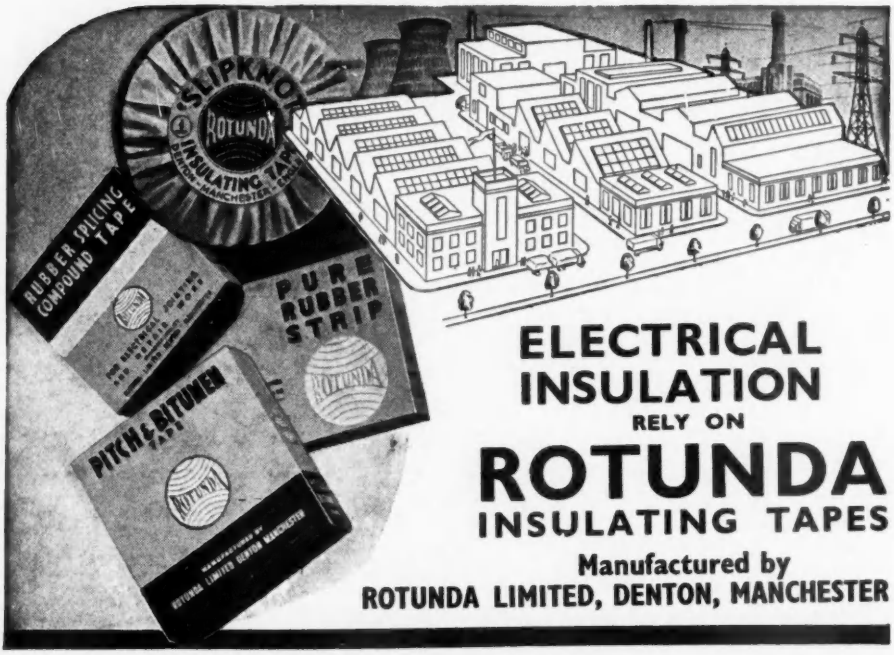
British Railways Southern Region are now replacing semaphore mechanically operated signals between Battersea Park and Coulsdon North, by a colour-light system. Large quantities of HENLEY Cables are being used in the installation, and our picture shows Henley 26-core rubber insulated lead covered signalling cable being laid into concrete surface troughing, between Streatham and Streatham Common.

(British Railways photograph)

BY APPOINTMENT ELECTRIC CABLE MANUFACTURERS

HENLEY CABLES

W. T. HENLEY'S TELEGRAPH WORKS CO. LTD., 51-53 HATTON GARDEN, LONDON, E.C.1



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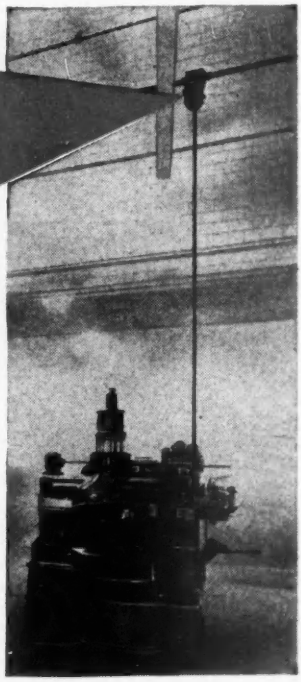


Make your machine-shop power supply FLEXIBLE

New type "Pull-Cap" Fuse Carriers and Bases

Fuse base contacts are shielded by insulating cover plates which ensure safe operation, and replacement of fuse-links is facilitated.

(British Patent No. 577848)

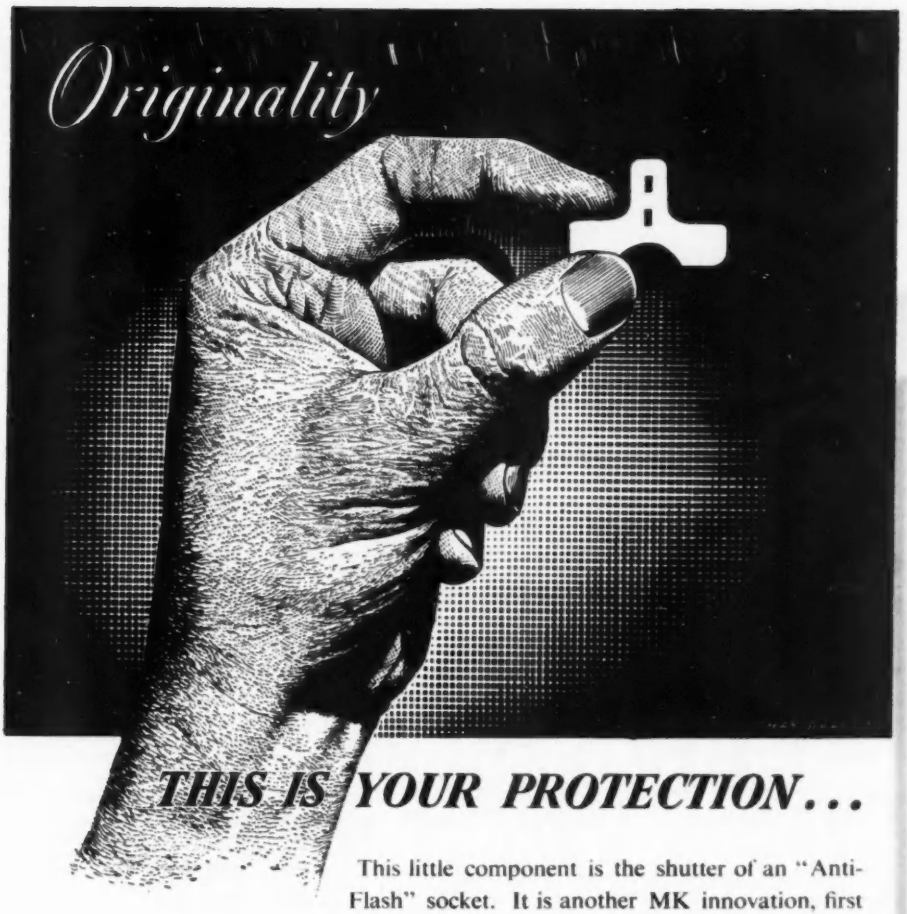
Simplify alterations and additions to your machine-shop layout without interruption of supply by using BICC Detachable Fused Tee Boxes. Easily installed along a cable run, they offer a feed-point system which is adaptable, simple, safe and economical.

Assembly consists of a main Cable Chamber and a readily attachable Fuse Box, rated up to 60 amps. These Fused Tee Boxes are designed for mains cables up to ·15 sq. in. with or without conduit and are equally suitable for new or existing work.

BI Callender's

DETACHABLE FUSED TEE BOXES

BRITISH INSULATED CALLENDER'S CABLES LIMITED
NORFOLK HOUSE, NORFOLK STREET, LONDON, W.C.2



THIS IS YOUR PROTECTION...

This little component is the shutter of an "Anti-Flash" socket. It is another MK innovation, first introduced 25 years ago. The purpose is fourfold: to cut off the arc; to ensure that the plug is driven home with a "snap" action; to protect inquisitive children; to exclude dust. This is one of the many original ideas from MK which have so greatly influenced the design of electrical accessories.

MK REGD

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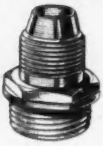
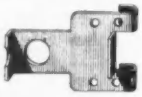
Lathe work  *Pressings in all metals* 

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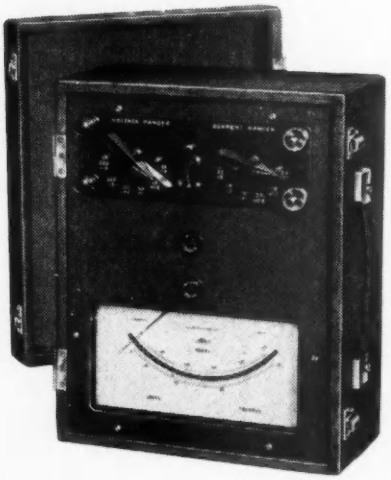

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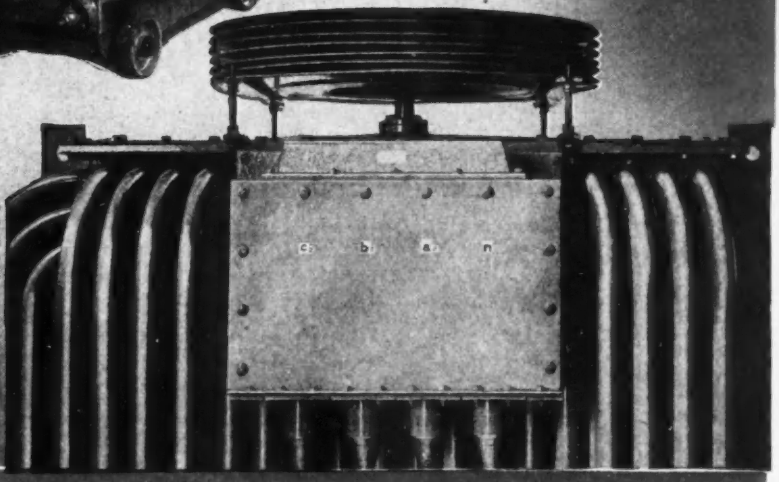

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FAWLEY REFINERY 499

OUR READERS' VIEWS 505

SMOKE ABATEMENT 505

ANOTHER STANDARD TARIFF 506

THE POWER BOARD SYSTEM IN N.Z. 506

PROBLEMS AND PRACTICE IN ENGINEERING 507

NOTES ON WIRING *by Megohm* 509

FLOODLIGHTING FOUNTAINS, *by W. J. Vine, F.I.E.S.* 510

ASSOCIATION OF PUBLIC LIGHTING ENGINEERS 514

OVERSEAS NEWS 522

PERSONALITIES IN THE INDUSTRY 524

MERSEYSIDE BREAKDOWN 526

POWER SUPPLY IN AUGUST 527

ELECTRICAL ACCIDENTS—1949 528

THE BUYER'S COLUMN 529

THE WEEK IN NEWS 531

Electric Supply News 536

Company Activities 537

COMMERCIAL INFORMATION 538

CLASSIFIED ADVERTISEMENTS 57

INDEX TO ADVERTISERS 66

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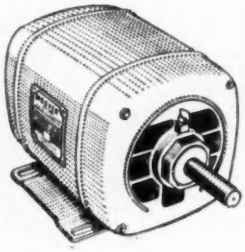

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Editorial

THE LAG OF STATISTICS

IT is nearly six months since the accounting year of the supply industry ended, and the broad pattern of the report is already known to those who move in the innermost circles. In consequence, judging from last week, the season is commencing when from the speeches of this select band there may be gleaned random fragments and figures of results of the year's workings. These serve little useful purpose other than to illustrate a particular point in the speech but the simple fact that such figures are quoted stresses once more the importance of up-to-date information. The B.E.A. seems to require anything up to nine months for the preparation of the Annual report, but in these days of a planned economy based on current statistics it is too long to wait for vital data. Meteor has suggested before that the publication of the more important statistics in quarterly statements would overcome this objection. It is a practice which has proved most valuable in connection with the National Coal Board and it should not be unduly difficult to adopt by the B.E.A. and area boards. From their own point of view it would have the advantage of keeping the public fully informed and provide a current source of facts for propaganda, which those speakers referred to earlier appear to lack.

CENSUS CAVEAT

AN important warning to firms has been given this week by the Board of Trade. In the forms for the census of production they will be receiving next January they will be required to return information regarding electrical plant installed and available on September 22 next. An analysis of the capacity of prime movers is asked for under types and also the total installed capacity of electric motors supplied by private plant, public supply or a mixture of both. The requirement of total horse power of fractional horse power motors should provide an occasion for some intelligent guesswork. In all categories the amount of plant idle or in reserve during the week is asked for; let us hope that unusual load shedding will not upset the figures. The consumption of fuel and electricity during the year is also required. The census form is clear and reasonably simple. Any anomalies which may arise are left to the form filler to solve, with the instruction "give the best estimates you can." It is not clear what useful purpose will be served by analysing motor capacities under the source of electricity from which they are supplied, on the other hand it would have been useful if provision had been made for recording the maximum demand where such a figure was available.

DECENTRALISATION

FROM two sources last week comes a consideration of the problems of decentralisation; one is a review by the Acton Society Trust and the other is found in two articles by Mr. J. W. Simpson in *The Municipal Journal*. The two Acton Society papers, "The Extent of Centralisation" are concerned with the Coal Board, which was selected as throwing up in greater relief those problems typical of all large-scale nationalised organisations. Decentralisation is the most difficult question which nationalised industry has to face, since on the one hand centralisation brings too top-heavy a structure while full decentralisation is not possible with statutory responsibility at the centre. It is in the measure of compromise between these extremes that the problem lies, and is reflected by the Coal Board feeling that control of the divisions is too slight, while the divisions themselves feel in danger of over control. This paradox is at the root of the difficulty; it is found at all levels. One of the causes for dissatisfaction from centralisation lies not in those defined spheres in which reference must be made to a higher level, but in those uncodified matters in which it is not clear where

authority lies. Yet to resolve the difficulty by an elaborate system of codification is not only to make the whole structure increasingly cumbersome, but to restrict further such scope for initiative as remains.

THE HUMAN FACTOR

THE Acton Society's papers deal at great length with the difficulty of the functional line and the role of specialists at different levels through which a channel of communication is provided parallel to that of the principal authority, so that the local manager may be faced with instructions from a subordinate specialist which have devolved from a higher level. In this respect the electrical industry is perhaps more fortunate than the Coal Board, in having fewer specialists but none the less, the difficulties of the dual channel are well known. It would seem that in our own industry there is room for some further weakening of the functional channel where authority devolves upon a single-headed organisation. The Acton Society Trust offers no simple solution of the problem, nor could one well be expected, but it strikes near to the heart of the matter when it suggests that it is primarily a problem of the adjustment of human relationships. Meteor would go further and say it is basically a human problem. The legal power to delegate is there, but it requires men with confidence and willingness to pass on the power which they have in their hands and it equally needs managers whose competence inspires the necessary confidence in their superiors. The tangled web of human traits will defy the most ingenious of organisational systems and to seek a universal administrative formula is to seek in vain; is not the answer to decentralise where and in such measure as confidence inspires.

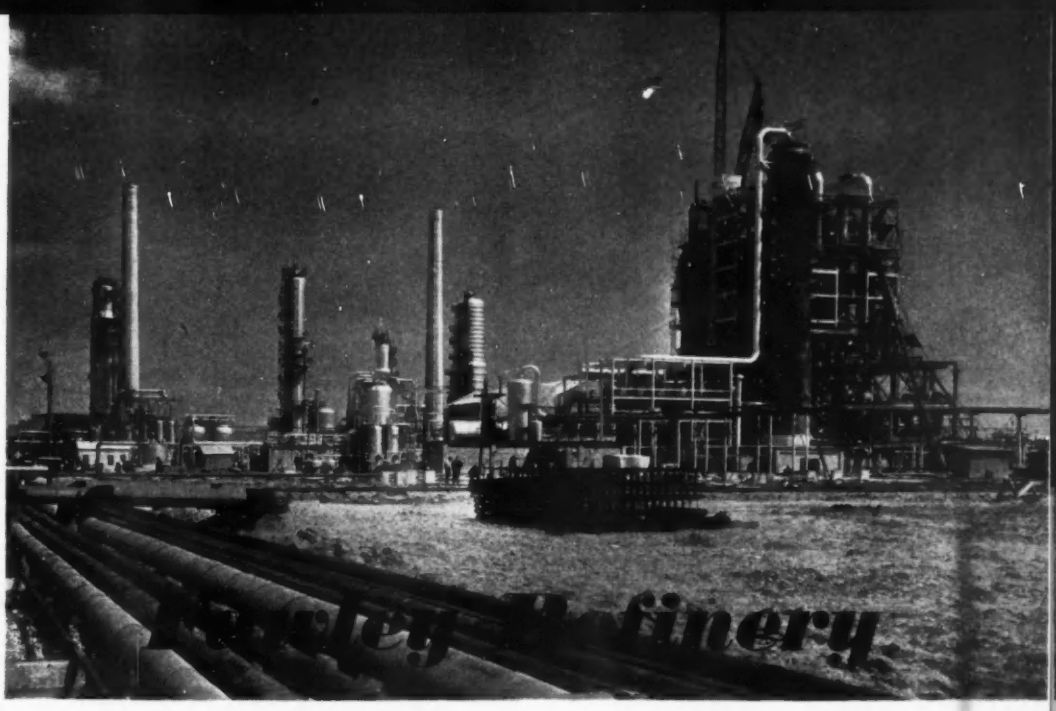
THEORY v. PRACTICE

STUDENTS of Dickens will remember the educational methods adopted in Dotheboys Hall by the immortal Mr. Wackford Squeers —"Spell Window. . . . W-I-N-D-E-R. . . . Now go and clean it, boy." What might be an extension of this method of utilising practical experiment to reinforce (or confound) abstract philosophy is being utilised by the Association of Public Lighting Engineers at their Brighton Conference this week. The respective merits of cut-off or non-cut-off lighting systems is not a new subject, nor one upon which opinion is largely one-sided—neither is it introduced in Mr. Stevens' paper in such a manner as to provide any ready-made set of ideas. By a happy coincidence—or clever planning—delegates are scheduled to visit a number of lighting installations (including several notable examples of the use of cut-off lanterns) in the evening of the day upon which Mr. Stevens introduces the subject. Thus the arguments of the forenoon, cut short by the approach of lunch, may be continued when the streets are—as Byron put it—"mellowed to that tender light which Heaven to gaudy day denies." In this way, the tour is likely to prove of more practical value in settling arguments than all the photographs and polar diagrams in the world.

ROADS OF MANY COLOURS

EXTENDING this principle a little further, it is a great pity that distance renders it impossible for delegates to take a tour of certain London suburbs before listening to the Presidential Address. They should preferably be not in motor-coaches, but in droves of baby cars driving themselves. Many complaints have been already made of the perplexity engendered by rapid changes from mercury to sodium and *vice versa*, but in certain districts they would find a single main route in a kind of glorious Technicolor with rapid alternation of mercury, sodium, tungsten and gas, interleaved with patches of utter darkness. It is, in fact, not a matter of merely losing the left-hand kerb as Mr. Stevens refers to so feelingly, but practically one of navigating by dead reckoning. Having taken this tour, the survivors would be prepared to lend a more receptive ear to the Address, and to assimilate Mr. Pryce-Jones's reminder that if some serious attempt at co-ordination is not soon undertaken on a voluntary basis, we shall find it carried out under some form of legislation.

Meteor



New Esso Project to produce 5·5 Million Gallons of Petroleum Products Per Day including more than One Million Gallons of Petrol

THE rapid increase in consumption of all forms of oil product over the past thirteen years has made it imperative to increase the refining capacity available. In addition to the general increase, the relative demand for various categories of fuel has also changed. In the past a large proportion of refined fuel was obtained from America, but again, the necessity for reducing dollar expenditure has made it undesirable to import these products. As a result of these factors, it was thought necessary to provide refining capacity on a large scale within this country, and a refining programme was drawn up representing an investment of some £125 million. New refineries being built will, when completed, raise the country's total refined petroleum production to about 20 million tons per year as compared with a figure of 3·5 million tons in 1948.

The largest single project in this refinery development programme is the new Esso refinery at Fawley, near Southampton, which will cost over £37·5 millions. When fully completed, it will be the largest oil refinery in Europe and will produce some 6 million tons of petroleum products per year including a daily output of one million gallons of high quality motor spirit. This represents the whole of the Esso Petroleum Co's anticipated requirements for many years to come, and is equivalent to somewhat more than a quarter of the United Kingdom demand.

No E.C.A. dollars were involved in the financing of Fawley which is a private enterprise project fitting in with the general picture of European recovery inasmuch as it will prove a great dollar saver, the estimated saving being about two million dollars per week.

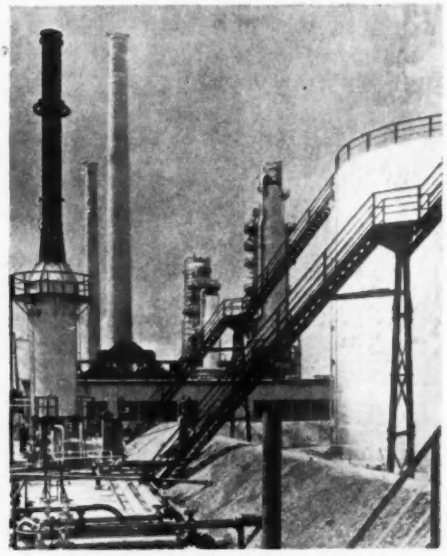
Site Requirements

As in all projects involving large engineering work, the first item was to select a suitable site. A number of alternative areas in widely separated parts of the country were examined, but the final decision was taken to proceed at Fawley where the Esso Company had an existing refinery. Several reasons, in addition to the existing plant, prompted this decision. The structure and elevation of the land offered the quickest and cheapest development for refinery construction, and the location is ideal for the distribution of the finished product throughout the United Kingdom both by sea and land. Shipping and berthing facilities are

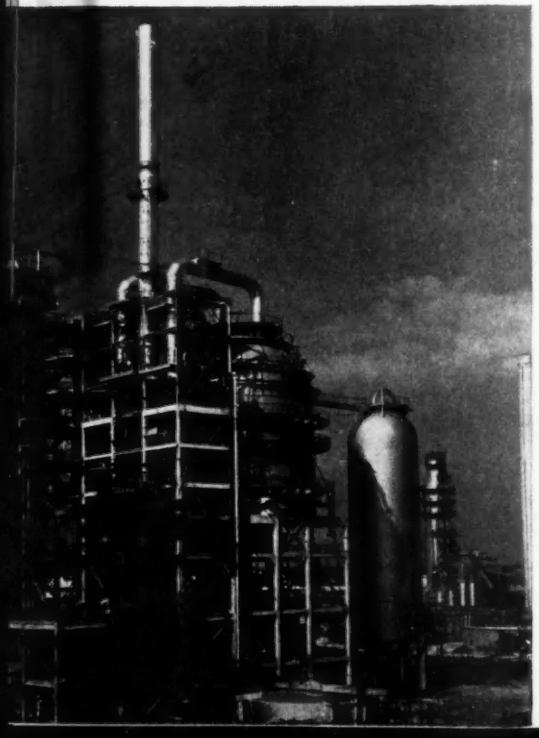
good, as the unique double tide and slow-moving current of Southampton Water enable fully laden ocean tankers to swing, berth or unberth, at any time of the day or night. In an emergency, tankers can quit berth at any stage of the tide. Further, the berthing site is fronted by about 2,500 ft of open navigable water and is isolated from other shipping activities. This provides an important safety factor in undertaking the large number of concentrated tanker operations involved. The size of tanker catered for may be as large as 39,000 tons. Finally an ocean tanker jetty already exists at Fawley and there is room for erecting four more berths as well as accommodation for coasters, bunkering vessels and barges. For land transport, Fawley is conveniently situated for a short haul to local industries and for the refuelling of shipping in Southampton Docks.

Oil Processing

In order to appreciate the complexity of the work, the following short description of the processing is given. As is well known, crude oils vary greatly in composition and apart from hydro-carbons contain many impurities such as sulphur. The various hydro-carbon groups contained in the crude oil are of many different combinations, ranging from large and complex molecules, such as asphalt, through ever smaller combinations to the light molecules such as petrol. These groups can be separated by fractional distillation and this is the first process undertaken at Fawley. Crude oil previously heated to a temperature of 750° F in pipe still furnaces, is flashed as vapour into the fractionating tower where the components condense on "bubble trays" at various levels. The first fractions to condense are residual oils, at the bottom of the tower, then "cat feed stock"

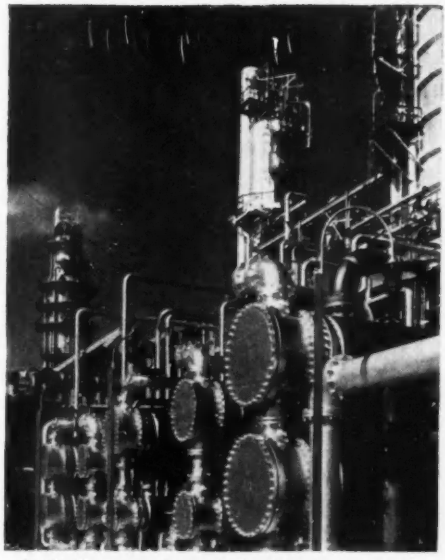


The "cat-cracker" shown on the left converts heavy fractions into lighter ones. Above is one of the furnace oil heaters and the crude units



for further processing, followed by light fuel oils, turbo-jet fuel and finally, at the top of the tower, raw petrol. All these sections undergo further processing before attaining their saleable form.

Starting with the residual oils, these are passed through a further pipe still heater and then into a vacuum fractionating tower which splits them into two further groups. The heavier fractions go to the asphalt still which divides them again into asphalt, industrial fuel oil and marine diesel oil, while the lighter fractions are chemically divided into lubricating oils and paraffin wax. Light fuel oils are chemically treated and become diesel and domestic fuel oils, turbo-jet fuel is divided into two sections and after chemical treatment becomes aircraft jet fuel, kerosene, and stove oil, while the raw petrol is also split for different treatments and becomes petrol, tractor distillate, and marine diesel fuel.



In the foreground are the heat exchangers with the crude units behind

Cracking

If the oil separation was carried out solely by fractional distillation the proportions of the various fuels and products would be entirely dictated by the proportions of the original constituents in the crude oil. The demand for these products is, however, dependent on outside factors, largely out of the control of the oil refiners. It is desirable, therefore, that it should be possible to convert the heavier fractions into lighter ones or *vice versa*. This is carried out by two processes, the breaking down of molecules being known as "cracking", while the building up of molecules is called polymerization. Both are carried out at Fawley, although the former is by far the more important. Two methods of cracking can be used. The heavy fractions may be subjected to very high temperatures and pressures, or a catalyst may be used with medium temperature and pressure. The principal method used at Fawley uses a refinement of the latter system known as "fluid catalytic cracking." The "cat feed stock" from the primary distillation is passed to the "cat-cracker" where it is vaporised.

The catalyst is so finely divided, that it flows like a liquid, circulating and intermingling with the oil vapour. This process possesses the advantage that a continuous flow of fresh catalyst can be maintained without the need for mechanical handling. The vaporised oil and catalyst are fed into a reactor, where in a dense swirling cloud, all the vapour comes into intimate contact with the catalyst. As the reaction progresses, incoming oil vapour and catalyst forces the cracked vapours and blackened catalyst to the top of the reactor, where they are separated, the clean cracked vapours being taken off by pipes for further processing and the carbon-coated catalyst being fed into a regenerator, where it is burned clean by a stream of air, and flows off to begin the cycle again.

A thermal cracking plant is also installed which converts lubricating oil and motor spirit into high-octane petrol plus a certain amount of gas. This does not use a catalyst.

Special Equipment

Although the above describes in brief the principal flow system, there are many subsidiary processes of importance. The debutaniser tower, for example, is a 113 ft high unit weighing 135 tons and is used for the removal of butane and other light gases from the motor spirit so that the latter meets the required vapour pressure specifications. The "copper sweetening unit" extracts corrosive compounds and unpleasant vapours from motor spirit. Kerosene is chemically treated in the Edeleanu plant to improve its burning qualities, and sulphur is removed in the hypochlorite plant. Sulphur is also removed from tractor fuel in the hydrodesulphurisation plant, which passes it in the form of hydrogen sulphide to a special plant now being built for the production of 99·5% chemically pure rock sulphur. When in full operation in 1953, this plant will produce 12,000 tons of sulphur annually.

Civil Engineering Work

The main civil engineering work consisted of levelling and preparing the site, building access roads and railway and constructing the marine terminal. To provide the vast quantities of concrete required for foundations, a plant, 100 ft high with an output rate of 140 cubic yards of concrete per hour was set up. A total of about one hundred thousand cubic feet of concrete was turned out by this plant alone. The task was, however, facilitated by the fact that the Fawley site contained ample quantities of excellent gravel. Many of the items were fabricated on site, others were shipped complete and erected in position by enormous derrick cranes, the largest of these being 264 ft high with a boom 140 ft long and with a lifting capacity of 100 tons.

A railway consisting of three-and-a-half miles

of single track connects with the Fawley-Southampton line of the Southern Region. This was built in six months, a remarkable achievement considering that an extensive cutting is involved.

Tankers of up to 39,000 tons will be able to berth at the new jetty. More than 600 piles, 71 ft long and with a cross section of 16 in. by 14 in. form the foundations of the 2,000 ft long approach over the salt marsh. This approach carries a great number of oil and steam pipes arranged in two tiers as well as a 4 ft dia. saltwater pipe line. A road for motor traffic with a pathway alongside is also included.

At the site of the berths, there was 30 ft of mud overlaying 10 ft of gravel, and beneath this 300 ft of stiff clay known as Barton clay. Dredging was therefore relatively economical as only mud had to be removed to get the depth of water required. In fact only 400,000 cubic yards of mud had to be removed to give a 34 ft low tide depth of water.

The jetty is supported on four hundred 85 ft long hollow cylindrical concrete piles, weighing up to 20 tons, and driven vertically into the bed of Southampton Water. They have an external diameter of 2 ft 6 in. and a wall thickness of 5½ in. Driving these piles was somewhat difficult in water where there is a considerable swell and two floating pile frames, fitted with steam hammers of 8½ tons falling weight were specially constructed for this purpose.

Four "T" shaped breasting islands have been built for the 39,000 ton tankers (not yet constructed) and each island rests against two dolphins or caissons. These are reinforced concrete cylindrical shells of 40 ft diameter, filled with sand and situated at each end of the breasting island. This 3,200 ft long jetty is one of the longest oil jetties in the world.

One of the 500kVA, 3·3kV/415 V outdoor substation transformers supplied by Metropolitan-Vickers

On the shore side of the jetty is a pumping house, supplying 50,000 gallons of salt water per minute to the refinery for cooling the various units.

Equipment

Owing to the fact that only one or two British organisations were in a position to cope with a specialised project the size of the Fawley refinery, and also that special items were only obtainable in America, it was decided to place the main contract for the procurement of major units and their erection in America with the Foster Wheeler Corporation, the actual work on site being executed by Foster Wheeler Ltd., a British affiliated company. The general policy, however, was to purchase as high a proportion of plant and materials in the United Kingdom as possible, and in effect orders in this country amount to nearly two-thirds of the cost of the refinery, and this proportion will increase as British manufacturers become able to

Simplex floodlights help work to continue during the night

accept further commitments.

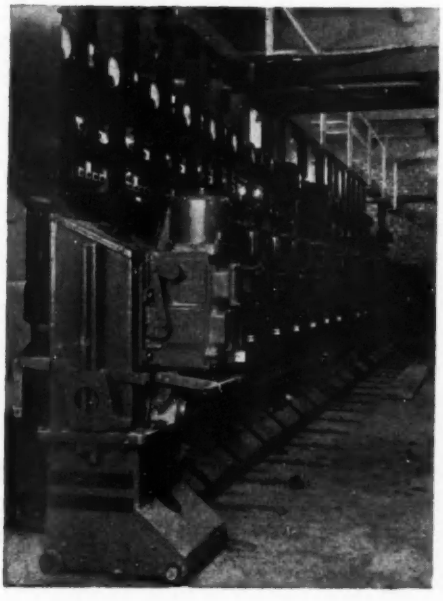
Originally the contract for electrical equipment was placed in the U.S.A. as it was thought that British manufacturers could meet neither the constructional programme nor the specification which was based on the extensive American experience in the oil refining business.

This view was opposed by Metropolitan-Vickers Electrical Co. who finally succeeded in negotiating a "blanket" agreement under which they undertook to supply all electrical equipment for Phase "A" of the project except where equipment originally ordered in the U.S.A. was too far advanced. This phase covered three stages.

Metrovick 500/600 h.p. 4-pole flameproof outdoor motors driving De Laval pumps at the product loading station

Stage 1 : Two pipe stills (crude distillation units) which went "on flow" on August 1, 1951; Stage 2 : The catalytic cracker and light ends debutaniser unit, which will be in operation in the near future, and Stage 3 : The Edeleanu sulphur-dioxide plant which is scheduled to go on flow at the end of the year.

The result of the agreement was that over 70% of the electrical equipment for Phase "A" was supplied by Metropolitan-Vickers, the remainder coming from I.G.E. America.



Later, the "blanket" agreement was extended and Metropolitan-Vickers are now supplying all the electrical equipment for Phase "B". This covers the polymerisation, tractor fuel and light oils, and sulphur recovery plant which are scheduled to go on stream by the end of 1953.

Under the terms of the blanket agreement, Metropolitan-Vickers provided a Project Engineer, whose main function was to co-ordinate all the engineering work and to control deliveries to site, prices and so on. The Standard Oil Company of New Jersey sent over an American engineer who worked in parallel with M-V. for 12 months, assisting and approving on the spot Metrovick's interpretation of the American specifications.

Equipment Supplied

The electrical requirements of an oil refinery of this size are mainly limited to pumping and lighting. Even so, the loading is far from inconsiderable. Power is brought in at 132 kV to a main substation and is there stepped down to 11 kV for distribution to five main-unit substations. Of these one has a capacity of 10,000 kVA and includes two 5,000 kVA 11/3·3 kV transformers, and the remainder are of 5,000 kVA, each possessing two 2,500 kVA transformers.

Each of these substations is a complete unit in its own right, having 11 kV switchgear, two main transformers, 16-23 panel, 3·3 kV switchgear boards complete with control panels, d.c. distribution boards, batteries, battery charger,

3·3 kV, type KOB2 oil-immersed automatic switch units installed in No. 1 substation

This silver commemoration plaque unveiled by Mr. Attlee will hang in the main hall of the administration building at Fawley refinery

interconnecting cables, lighting, and other substation ancillaries. The majority of the switchgear is oil-immersed, metal-clad type KOB2 or type KOC.

From the five main-unit substations supplies are also taken to 11 secondary-unit 3·3 kV/415 V substations. Five of these have a capacity of 750 kVA, two are 500 kVA, two of 300 kVA, and two of 100 kVA. Each of these consists of 3·3 kV/415 V outdoor transformer of the appropriate rating, interconnecting cables and type AIR switchgear.

Each substation has an automatic transfer scheme: if a fault occurs on one bus a duplicate system is brought in automatically to prevent interruption to the supply. The low-tension switchgear feeds turn-around (or maintenance) centres and motor-control centres.

Cabling for the scheme—which was supplied by the Edison Swan Electric Co. Ltd.—is treated to withstand the operating conditions, the majority of that open to the atmosphere having p.v.c. insulation in order to give adequate resistance to oil and chemical fumes.

Motors and Fittings

Over 140 motors, the majority of the totally enclosed, fan-cooled, flame-proof type, have been supplied. These range in output from 1½ h.p. up to 600 h.p., and have been specially designed to minimise sparking and to provide resistance to corrosion.

Lighting also provided special problems, and Metropolitan-Vickers Ltd. supplied over 3,000 items, including flameproof fittings; specially designed vapour-type gauge glass and well glass fittings for use in semi-hazardous locations where fully flameproof fittings are not necessary (the vapour-type fitting prevents the infiltration of gas, but is not designed to withstand the force of an internal explosion); cast aluminium floodlights; fluorescent and incandescent street lighting fittings, together with associated accessories; and miscellaneous electrical accessories.

During the construction of the refinery Simplex Electric supplied many Reflecto-Flood floodlights, which enabled work to be carried out at night, and the same company also provided flameproof conduit fittings, switches and so on.

Lighting in the large administrative block and in the laboratories was undertaken by the General Electric Company, who were also responsible for the interior lighting of the canteen, and the dockmaster's building.

Opening Ceremony

The opening ceremony was held, thanks to clement weather, in the open air, and over five thousand guests were present. Preliminary speeches were given by Mr. L. Sinclair, chairman of Esso Petroleum Co., Ltd., who referred to the great work done by the Foster Wheeler Co. with the co-operation of the British Associated firms and the British workpeople, and by Mr. F. W. Abrams, Chairman of Standard Oil Co., New Jersey.

Performing the actual ceremony, which consisted of unveiling a silver engraved plaque, showing the principal components of the refinery, Mr. Attlee referred to the Abadan difficulties, and said that sufficient motor spirit to replace that normally exported from Abadan had been guaranteed up to the end of 1951; a slight shortage of other petroleum products might, however, be expected. There was every reason to expect the position would show an improvement in 1952.

One benefit of Fawley was the sulphur-production plant. Sulphur was a nuisance in oil, but a necessity for many industrial processes. The estimated output of 12,000 tons/year would make a useful contribution.

Of greater importance was the contribution of Fawley to the solution of the balance of payment problem. The project had played an important part in negotiations last year on the dollar-sterling oil question.

Our readers' views ...

Floating Power Units

I FEEL that recent references in the Press to the use of old ships and floating power plants derive in some measure from the published comments of mine on the paper entitled "The Economics of Electricity Supply," presented by Sir Henry Self to the British Electrical Power Convention at Harrogate in June, 1950.

As there appears to have been some recent confusion of thought on the matter, it seems incumbent on me to point out that my summarised points on the paper referred in particular to "Floating Generating Units" of a design that would lend itself to standardised construction.

My allusion to the turbo-electric vessel *Viceroy of India* was used in the context in a comparative sense as supporting the view that blocks of plant of 30 MW or more might reasonably be installed on the floating units.

The reference to "Floating Generating Units" was deliberate and envisaged the use, by themselves or in combination, of less conventional types of hull than those of normal ships; indeed, a floating dock type of construction was cited with ample crane and workshop facilities for normal maintenance operations.

It was further suggested that the appropriate design must be a matter for ship designers and would be based on the essential requirements of the electricity system. For example, the normal pontoon flooding arrangements would be dispensed with, as would also the normal portal jib cranes, to be replaced by a normal type of engine-room traversing crane. A single-span "blister" type of self-supporting roof would be required, together with the closure of the ends of the structure with allowance for the admission of plant and stores.

Mention has recently been made of the maintenance of hulks in seaworthy condition, but these problems are well understood by marine engineers. Suffice it to say that the pontoons of a floating dock may be detached individually and serviced in the dock itself, thus rendering a major overhaul of the hull unnecessary, so that the life of the vessel would be as long or longer than that of the plant installed.

There is little doubt that the policy of the British Electricity Authority of installing as much high-efficiency base-load plant in as many land stations as and where procurable is correct, but the claims of less conventional and cheaper forms of construction for peak load and emergency conditions ought not to be dismissed lightly.

It may, therefore, be pertinent to again summarise some of the merits of floating power units:—

(1) Avoidance of site acquisition and preparation entailing special provision of fuel handling and circulating water facilities.
(2) Saving in time and capital by reducing the problem of housing the plant to one of simple standard mechanical construction.
(3) Lower operating costs due to ease of fuel handling and low pumping costs.
(4) Availability of substantial generating reinforcement to areas affected by dislocation or breakdown.

Since the operation of units in combination might make the use of coal a feasible proposition in certain circumstances, the more usual fuel would be oil, and, from the fact that Diesel engines of the order of 10 MW capacity are today possible, it would appear that groups of units of this capacity or, alternatively, gas turbines would be the more appropriate type of plant for the purposes outlined rather than steam plant. It should also be borne in mind that the local generation of kilo-vars where required would have beneficial repercussions on the grid system stability and operation.

O. H. Hosking
WOLVERHAMPTON Sub-Area Engineer.

SMOKE ABATEMENT

NATIONAL fuel problems and shortages, from the standpoint of the coal wasted in the form of smoke, will be the background of the three-day conference of the National Smoke Abatement Society opening in Blackpool on September 26.

Among the many lectures and papers, the Des Voeux Memorial Lecture "Power and Waste in their Social Setting," by Dr. J. Bronowski, should be of great interest. Of special importance will be a session in which representatives of the coal, gas, electricity, iron and steel, and cement industries will describe the policies adopted by their organisations in progressively preventing atmospheric pollution.

Another session will be devoted to the small steam raising plant, and domestic installations will be dealt with by Mrs. E. Fraser-Stephen (solid fuel), Miss M. A. Lovell Burgess (gas), and Dame Caroline Haslett (electricity).

Another Standard Tariff

A NEW standard domestic tariff is to be put into operation from the first meter reading on or after October 29 by the Merseyside and North Wales Electricity Board. Thus, the Board becomes the sixth Area Board to announce the step in conforming to duties imposed upon them under the 1947 Act.

Under the Board's new tariff a number of primary units in each quarter will be charged at 4½d. p.u., and the remainder in that quarter will be at the lower secondary rate, at present 0·85d. per unit. Where prepayment meters are used the price for the primary block of units will be 5d. p.u. with the remainder at 0·85d. p.u., but meter rents will not be charged.

Primary Units

As with the new standard tariffs of the other Boards, the number of units charged at the higher price in each quarter is determined by the number of assessable rooms in the house. In this instance, the actual figure is 12 units per room up to 10 rooms and 8 units per room for all in excess, the minimum assessment of any house being two rooms. But such accommodation as larders, bathrooms, garages and tool sheds are not counted when determining the number of rooms.

This new standard tariff will replace the present 147 varying prices and methods of charge and some 50 calibrations of prepayment meters. The Board stress that it is inevitable that some consumers will pay more than they did formerly and others less.

When the new tariff was discussed at last week's meeting of the area Consultative Council, several members opposed it on the ground that it may cause hardship to the smaller, and poorer consumers. Others also suggested that the primary block units should be charged at 4d. instead of 4½d., but this would mean a loss of £315,000 to the Board, it was pointed out.

Mr. W. Gilchrist, chief commercial officer to the Board, told the Council that it was impossible to give any figure which would show the number of consumers who would pay more, and of those who would pay less; but it had been estimated that domestic revenue in Sub-area No. 1 would increase by 3·6%, and in No. 2 by 0·7%, while there would be a decrease of 1·17% in No. 3 sub-area and of 3·3% in Nos. 4 and 5 sub-areas.

The aim of the Board had been to ensure practically the same revenue as at present, and it was hoped that the results would be within £50,000 of the £5,000,000 revenue aimed at, he added.

The Council, after further discussion, gave their approval to the new tariff.

THE POWER BOARD SYSTEM IN N.Z.

THE Power Board system of distribution prevailing in many parts of New Zealand is an unqualified success, judged by the various reports we get of such undertakings. In general, the Boards cover sparsely populated areas, power being obtained from the State Hydro Electric Board. At present there are some 43 Power Boards operating in the Dominion alongside 40 other supply authorities, but it has been suggested that the day may come when the Power Boards will be the sole distributing authorities. However that may be, the Boards have shown great determination in extending supply to remote districts, with the assistance of a subsidy.

A typical example is the Hutt Valley Electric Power Board, in the North Island, which commenced operations just over 25 years ago, and now covers an area of 600 square miles. This Board now has 26,225 domestic consumers in a population of 85,210 and it is estimated that a supply of electricity is available to the whole population except for less than 100 persons, according to the report for the year ended March 31 last, just to hand.

The Board also claims that its average selling price per unit is the second lowest in New Zealand —throughout its area, the Board's tariff for domestic and farm supplies is 3s. 9d. per month fixed charge, plus ½d. p.u. It can thus be truly said that this Board is admirably fulfilling its job of selling to consumers at the lowest possible price. For the year to March 31, 1951, the total revenue was £378,520 and the net surplus £472. A total of 1,413 new consumers were connected during the year, of which 488 were in all-electric State houses.

Appliances Installed

The Board sold over 122 million units in the period, some 80 millions alone being for domestic use. Domestic electrification has, of course, reached a high standard, although only 54% (14,210) of the consumers have electric cookers while 57% (15,058) electric water heaters are connected, which would seem to indicate that there is still scope for some strong salesmanship.

On the engineering side the major work carried out was the erection of another double circuit feeder—in all some 20½ miles of 11 kV o.h. line and 1·15 miles of 11 kV underground cable were laid. The Board is still beset with difficulties caused by the rationing of electricity, but it is considered that "there are advantages in the existing method in a properly controlled system as against the vagaries of the complete cutting of supply from time to time as applies in other countries." But as an example of the detailed work which follows in the train of a rationing scheme, it is admitted that 11,633 letters have been forwarded to consumers since the scheme was commenced, and 3,960 letters sent to new consumers advising them of their allocations.

Problems and Practice

IN ENGINEERING

Fire Through Overlubricating

ONE of the knitting machines at our factory caught fire. Blame was immediately placed on the Electrical Department by presuming a burnt-out motor due to overheating through lack of maintenance, but our books proved that the motor was only recently overhauled, so a check was made on the machine.

The motor was stripped and tested, the only trace of anything wrong was the singed remains of fluff, which is menace No. 1 in the hosiery trade. The motor passed all tests and was soon running again. The wiring on the machine was then checked, to be found in good order and insulation perfect.

Next came the starter and on checking, line for line, we noticed a stain of burnt oil near the starter contacts. On tracing where the oil had come from we noticed that it had run down the spiral of the flexible conduit into the starter (the oil having a mixture incorporating paraffin), soaked into the "fluff" inside the starter and had trailed down as far as the starter contacts.

On the starter "breaking" the spark had ignited the "fluff" wick which, in turn, retraced itself up the oil track and ignited the oil soaked fluff on the machine causing a flare up. So it proved the fault of the operator in overlubricating his machine, and a sigh of relief from the Electrical Department.—*A. K. Williams.*

Unequal Current Distribution

UNEQUAL current distribution in parallel connected a.c. single conductor cables is unavoidable in such cases where it is impossible to combine one cable of each phase to three phase units fixed together with minimum clearances with a zero resultant magnetic field due to $\Sigma i = 0$ under normal working conditions (Fig. 1). In the case of a 20 MVA 3 kV generator with I_n approximately 4,000 amps with four s.c. cables 1,250 mm² each per phase, the distance between generator and switchhouse was too short for making transpositions as mentioned above.

The ducts only permitted the arrangement of the 3×4 cables in the same plane, resulting in a percentage current distribution as shown in Fig. 2. The "attractive" effect of the currents to minimise the total reactance is obvious.

The current distribution was perfectly

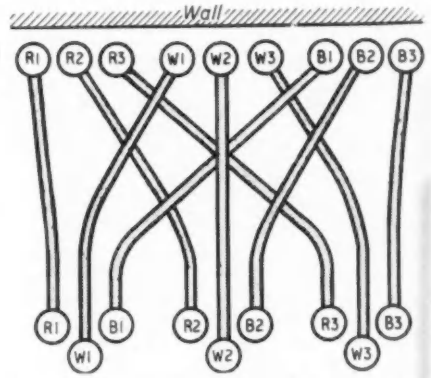


Fig. 1. Arrangement of cables when transposition for zero magnetic field is possible

equalled by increasing the reactance of the inner conductors by fitting of an appropriate number of closed laminated iron cores sur-

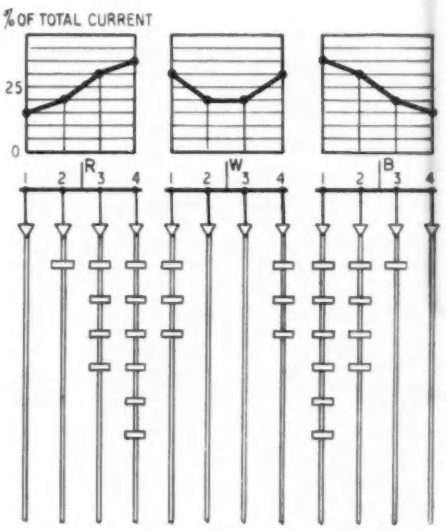


Fig. 2. Current distribution in the cables when the iron cores described in the text are fitted

rounding each cable. The current distribution was checked with a tong-test.

All cable sheaths were earthed at the switchgear end only and not cross-connected. This is tolerable for short distances, e.g. not longer than 50 metres with the cables firmly fixed between hardwood clamps, so that even under short circuit conditions they cannot alter their relative positions.—*A. W. Zuidweg,*

The Hague (NL).

Motor Starters

THIS note anent oil dashpot starters of the lower ratings may be of interest in cases of the more obscure faults, etc., which sometimes occur during the experience of the maintenance electrician. Readily perceivable causes of failure, etc., and makers' instructions are excluded.

Failure to start motor on light load following a period of normal functioning is mainly due to lack of oil in one or more dashpots. Loss of oil often occurs due to capillary attraction at the pot-threads and those engaging them, and oil retention may be prolonged if screw threads and pot interior above oil level mark are cleaned and well dried, and oil afterwards carefully transferred centrally into the pot by means of either a pipette or a rod.

Partial or complete loss of protection under fault conditions, and fuses blowing in switch-fuse. This is usually due to absence of one or more tripping pins which operate the tripping bar. Violent action due to lack of oil and excessive traverse of the tripping bar sometimes cause the pins to be ejected from their recesses into the starter housing, where they often escape the notice of the uninitiated owing to their small dimensions. It is easy to see that the protection lost and danger to the o/l coils —e.g., in a three-phase starter—increase with the number of pins missing; hence the importance of these pins being in position before putting a starter into commission.

Fit starter on a vibration-free support, and in a location not subjected to large variations of temperature.

Align starter vertically in two planes at right angles to each other. Excessive mal-alignment has been known to cause tripping under light load due to plungers failing to return completely into their recesses either after operation or after switching off.

Incidentally, it would be interesting to know what objections would be raised against employing dash-pots of transparent material, e.g. oil-resisting plastic or even glass, and having a thin buoyant ring of dark material floating on the oil surface. This ring would probably tend to reduce oil splash during operation—and hence creepage—and would also greatly assist an electrician, since he would be able to see at a glance if pots contained oil to correct levels, instead of having to unscrew and replace three pots to each three-phase starter often without necessity. Such pots would also furnish a means of observing plunger and oil actions under working conditions. The answer to this rests with the designers and manufacturers.—"*Solenoid.*"

Pyrotenax Installations

I FEEL bound to comment on at least two of the points mentioned by your correspondent S. M., dealing with Pyrotenax Installations, and appearing in your issue of September 6, 1951.

Generally speaking, I must agree that the ideal method of erection is with the minimum of handling, but to say that a hammer should never be used is defeating one of the advantages of this type of cable. I have now been responsible for the erection of a good number of miles of this type of cable, and have never found a case where the cable has been damaged by the use of a hammer. In fact, it is not possible to damage the cores of the cable until the outer sheath has been actually split, allowing the magnesium oxide to fall out. We have from time to time experimented and have beaten and distorted trial lengths of this cable out of all recognition, and have found that a good test is maintained until the outer sheathing is broken.

Experience has not confirmed the necessity of sealing the ends of cables so suggested. We have found that moisture will only travel for a short distance inside the cable, and as it is usual to strip off three or four inches to form the tails, the loss always proved sufficient to clear any dampness in the oxide.

A certain amount of discretion should also be used in making connections to motors, as shown by your correspondent. This may be satisfactory for small motors, but it would be a difficult job to carry out if large single-core cables were being used. It should also be remembered that age will harden copper and after a period of time the coil would not show much advantage over the direct method shown in Fig. 1 of his note.—*H. J.*

Contributions to this page dealing with specific items of interest to electrical engineers and maintenance men are welcome, and, if accepted, will be paid for at our standard rates. Contributions should be written on one side of the paper only and may be accompanied by sketches, which will be re-drawn for publication.

Notes on Wiring
by **MEGOHM**

Portable Electrical Equipment

Attention Needed to Ensure Safe Use on Site

ON and about every building site will be seen portable electric drills, hammers, floor polishers and grinders, spray guns, soldering irons and hand lamps. Today it is generally realised that the use of electrically energised tools is essential to speed up production and reduce installation costs, and in view of the large number of electrically energised portable tools and hand lamps that are now in use on sites, it is of great importance that they are properly designed and maintained.

Reportable electrical accidents compiled and published by the Electrical Branch of the Factory Department state that of the total fatalities reported, 7·75% were due to defective portable electric hand lamps and 16% were due to defective portable electrically energised tools. This, of course, does not mean that all these accidents occurred on electrical installation work. Nevertheless, these figures leave no doubt in my mind that it is essential that proper maintenance and supervision is necessary to ensure prevention of accidents, whether they be on process, installation or maintenance work.

Reducing Risks

Methods available for reducing the risk of accidents are: (*a*) The equipment and lamps should be used by operatives who have received instruction in the proper handling and the dangers resulting in misuse. (*b*) The equipment and lamps should be of sound design and manufacture, and (*c*) The operating voltage should be reduced.

Operatives should take reasonable precautions to satisfy themselves that portable equipment and lamps being used are in sound condition. Flexible cables should be checked for defects, especially at terminations, the non-carrying current metalwork should be properly earthed and insulating material such as brush-holders and the like should be inspected for breaks or scratches on the polished surfaces. Finally the equipment and lamps must be checked to ensure they are suitable for connection to the voltage of the supply on site.

These are simple and obvious safeguards, but unfortunately we are all sometimes inclined to be careless, especially when using a particular drill or hand lamp over a long period, and it is under these conditions accidents generally occur, as is illustrated by the following incident. A broken insulated brush-holder of an electric drill exposing live metal was repaired by filling in the break with a Plasticine compound, the drill having been in use over a period in this condition. At the time of the accident the drill was in use in a very warm location and the Plasticine compound became displaced by the warm hand of the operative, resulting in contact of the palm of the hand with the live metal work of the brush-holder and the earthed metal work of the drill casing.

Here is an accident that with a little care would never have occurred. The manufacturer of the drill in question, I suggest, is not entirely free from blame, since if an earthed metal cover plate had been fitted over the insulated brush-holders, such an accident could not have occurred.

Recording Tests

A simple method of recording periodical tests and inspections on portable equipment and lamps on site appears to me to be an essential procedure to ensure that they are in sound condition, and further such tests and inspections should be carried out by a reliable electrician who should also be responsible for entering the test results in a duplicate record book at least once a week, the top copy of the test sheet being handed to the engineer in charge.

The reduction of the operating voltage from the standard 240V a.c. mains voltage is an essential precaution to adopt, is simple to achieve, and provides for maximum safety against shock. The British Electricity Authority have specified on their constructional contracts that the operating voltage for portable equipment shall not exceed 110 V, and for lamps 25 V. Further, the maximum voltage to earth shall not exceed 55 V, which I hope all will agree is a step in the right direction.

Floodlighting Fountains

Use of Fluorescent Tubes for Under-water Illumination

By W. J. VINE, F.I.E.S.

FOUNTAINS and water gardens hold a universal appeal. From time immemorial sculptors and engineers of every race, creed and nationality have applied their creative arts to the design and construction of these fascinating objects, some of which fully deserve their rank as masterpieces. The Romans and the Greeks employed them in architecture, and there is evidence in ruins of even greater antiquity that older civilisations were equally subject to their fascination.

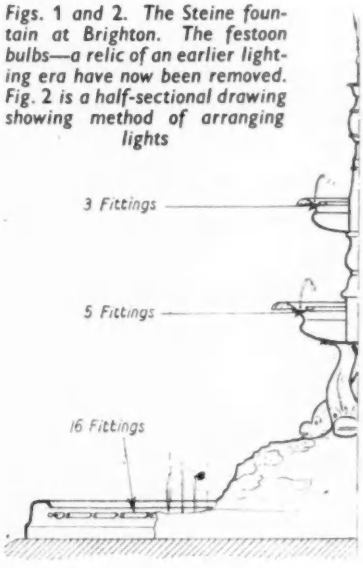
Until the beginning of the present century the skill of the artist and sculptor tended to overshadow that of the engineer, who, more often than not, was merely required to pipe the water to the ornamental orifice from which it emerged. With the coming of electric power, however, two new avenues of development were opened, the high pressure multi-jet fountain and the illuminated fountain. By the mid-twenties the modern conception of an all-electric fountain was created in which sequences of water display and colour changing were completely automatic.

Now the engineer supplanted the sculptor and the artist. So far as the frame was concerned within which the fantasy played, it might just as well not exist for, to put it bluntly, the modern electric fountain is all too often a thing of beauty only when it is playing. It may be questioned, of course, as to whether the ornate decorations with which our forefathers encrusted some of their fountains were beautiful either, but that is by the way. The point is that they were designed to be viewed with or without their watery trimmings; the modern fountain is not.

This is illustrated by two fountains within a stone's throw of each other at Brighton—the Steine and a modern all-electric fountain. The former, originally known as the Victoria Fountain, was first opened in May, 1846. History records that it was conceived by a Brighton surgeon, Mr. J. Cordy Burrows, designed by a well-known contemporary architect, Mr. A. H. Wildes, and made and erected by Messrs. Williams and Yearsley.

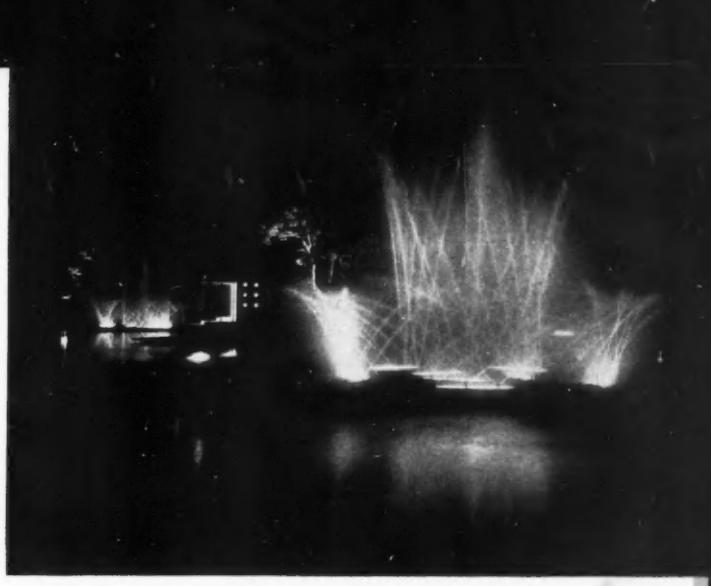
The fountain is 50 ft in diameter and 32 ft high and consists of two bowls, one above the other, on a support in the shape of three dolphins intertwined, within a larger basin which also accommodates a bed of irises. The

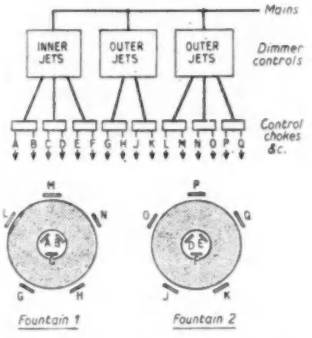
Figs. 1 and 2. The Steine fountain at Brighton. The festoon bulbs—a relic of an earlier lighting era have now been removed. Fig. 2 is a half-sectional drawing showing method of arranging lights

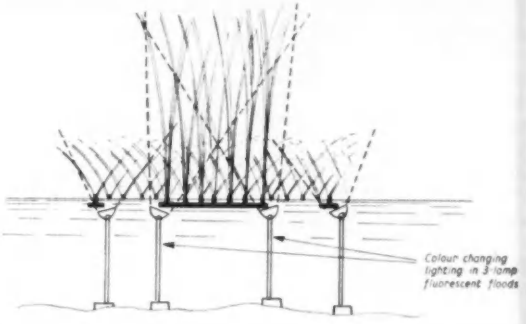


work is executed in cast-iron with bronze-green finish.

For the first 50 years at least the fountain was not illuminated. Sometime in the early days of the present century, electric "fairy" lamps in colour were festooned around the bowls and supporting structures. The age of electric fountain lighting had begun. But fountains like the Steine do not lend themselves readily to con-







Figs. 3, 4 and 5. "Hampton Court" fountains at Jephson Gardens, Leamington Spa. The diagram on the left shows method of dividing the sections between the three dimmers

version to the modern conception of what an electric fountain should be. The most that can be done, without completely dissembling the whole edifice, is to give added pressure to the jets by installing a boosterpump.

The all-electric fountain by night completely outshone the Steine Fountain. By day, however, the positions were reversed, since the base of the all-electric fountain is purely functional and lays no claim to artistic significance.

The Steine Fountain

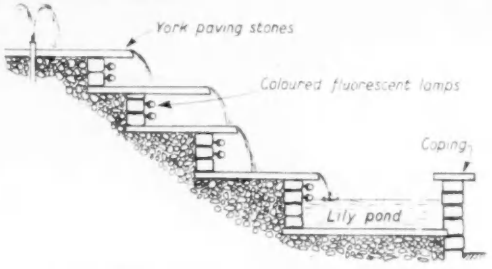
During the 1951 British Electric Power Convention, Thorn Electrical Industries Ltd. obtained permission to carry out an experimental installation of fluorescent floodlighting on the Steine Fountain. The result has been a transformation of surprising beauty which would surely have gladdened the heart of the designer had he lived to see it. It was the centre of attraction during the Convention and has now been retained as a permanent feature of Brighton's illuminations.

Figs. 1 and 2 show the appearance and the methods adopted. Twenty-four reflectors are accommodated in the bowls and basin—three in the upper bowl, five in the middle bowl and eighteen in the basin. Each reflector houses three 5 ft 80-watt lamps in pink, blue and green, controlled by three automatic motor-operated colour-changing and dimming units. No attempt has been made to synchronise the speed of the motors; consequently the range of colour effects is practically infinite. Only two colours are blended in each reflector at a time. Shades of white only appear on fringes occasionally where colours from adjacent reflectors mix, but all possible hues derived from two-colour combinations appear each full cycle per reflector.

Only two sets of control gear—chokes and "Quickstart" transformers—per reflector are required and no colour filters are needed, the colour of the light being generated direct by the phosphor. The light output efficiency (lumens per watt) is high compared with

Figs. 6 and 7. Rock gardens and cascade in Leamington Spa Gardens

incandescent-plus-filter lighting. For example, the blue is nearly fifty times the light output of incandescent-plus-filter lighting of the same loading and colour. Overall the efficiency is approximately ten times that of the incandescent combination for all colours. The reflectors are open type asymmetric with anodised reflecting surfaces, and the lamps are bare with only the ends protected by waterproof sleeves.



Jephson Gardens

Another type of fountain is one which forms the centrepiece of an ornamental lake. Here no superstructure is visible, the jets rising directly from the surface of the water. A classic example is the pair of such fountains in the Jephson Gardens, Leamington Spa (Fig. 3). These have been illuminated for some years as part of the spa's seasonal attractions, and this year Mr. J. W. Nunn, Leamington Spa manager, acting on behalf of the Special Committee of the Borough Council, requested Thorn Electrical Industries Ltd. to install a system of fluorescent colour floodlighting which was officially inaugurated on August 6.

The two fountains in the lake are controlled from three automatic colour-mixing and dimming units. In all, 16 submerged reflectors of the open type are used, eight to either fountain, each reflector housing three 5 ft 80-watt colour fluorescent lamps. Three reflectors illuminate the centre jets, the remaining five being distributed around the periphery. The centre jets of both fountains are controlled from one dimmer, the remainder being divided equally between the other control units as shown in Fig. 4, this arrangement giving a colour sequence of almost infinite variation, since the motorised units are not synchronised. The reflectors, again with bare lamps and ends protected by waterproof sleeves, are supported below water level adjacent to the jets on simple stands as shown in Fig. 5.

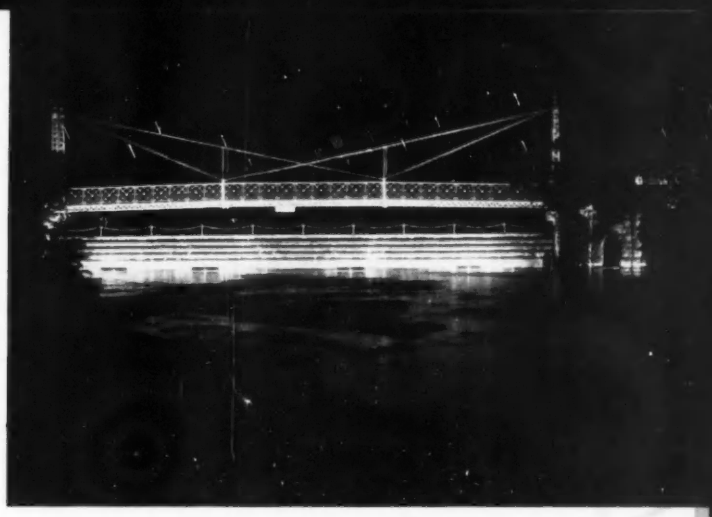
Another feature of the Jephson Gardens is the weir and suspension bridge spanning the River Leam, which passes along one boundary of the gardens. Four open type reflectors, with bare lamps and housing three 5 ft 80-watt green fluorescent lamps floating on the surface of the water at the foot of the weir, are held in position by chains anchored to the banks, illuminating the bridge and weir, while one buttress is picked out in white by incandescent spotlights for contrast. Actually the load on the whole of the fluorescent equipment is approximately equal to that of the white spotlights—1 kW—giving an excellent object lesson in the comparative efficiencies of the two illuminants (see Figs. 8 and 9).

Rock Gardens

Adjacent to the refreshment marquee is a rock garden which includes a miniature waterfall and cascade. Here again fluorescent lighting has been used. Twelve 2 ft 40-watt lamps, controlled in pairs and in static mixed colours, are clipped beneath the ledges of the cascades. No reflectors are used, but the ends of the lamps are protected by weatherproof sleeves. The load on this section is under half a kilowatt, the colours being seen through the cascading water with entrancing effect. (Figs. 6 and 7.)

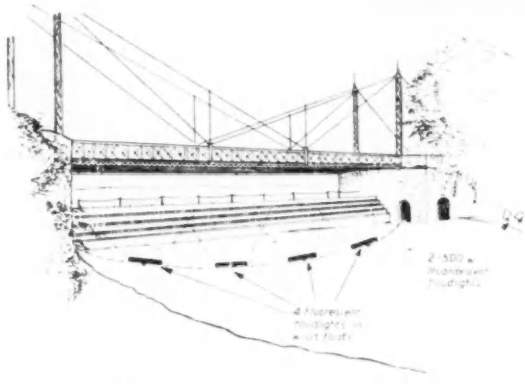
Comparative Costs

The high efficiency of fluorescent lamps permits the use of greater intensities than with



Figs. 8 and 9. Floodlighting the weir and suspension bridge over the Leam

incandescent lighting and the colour effects have more life, particularly in the blues and greens. First cost is low, the absence of expensive waterproof enclosures for the lamps offsetting that of the additional control gear by a considerable margin, while the system permits of exceptional latitude in adjustment, either with static or colour changing requirements. Not only are the dimmer control units capable of mechanical adjustment, but, by varying the arrangement of lamps in each reflector, a single controller can be made to produce contrasting colour change sequences in adjacent lighting units on the same circuit.



At Leamington, in addition to the installations mentioned above, it is also used to floodlight trees and shrubberies. At the rear of the main lawn, which is used for dancing and putting, a bank of trees, including one of the most magnificent cedars in the country, forms a background which is illuminated by 24 three lamp units controlled by three auto-dimmer and colour-mixing panels, augmented by two banks of five similar units in static green. The maximum load on this circuit is just under 6½ kW, but the total lumen output has been calculated to be equivalent to over 60 kW of incandescent-plus-filter lighting.

The cost of fluorescent floodlighting equipment is actually lower than that of similar incandescent floodlighting. In place of a single reflector housing three 5 ft 80-watt colour fluorescent lamps which do not need weatherproof enclosure, the incandescent installation requires three separate 500-watt weatherproof floodlights with colour filters. The current is much higher, necessitating heavier cables and more robust dimmers; consequently the capital cost may be as much as 50 to 60% in excess of that of the fluorescent floodlighting, while average running costs are ten times as great.

There would appear to be hardly any limit to the application of fluorescent lighting to fountains and water gardens. It brings added beauty to the sculpture and decorative features of fountains of an earlier age which have, in recent years, been overshadowed by the more spectacular "all-electric" fountains. Many possess a subtlety of artistic grace and detail which can usually be greatly enhanced by the delicate hues possible with fluorescent lighting.

Wherever architectural features abound—in sculptural groups, mansions, palaces, public buildings, etc.—fluorescent floodlighting is capable of revealing unsuspected beauty, while for floodlighting of natural surroundings it has no peer.

As each new fluorescent floodlighting installation must be subject to individual specialist treatment, arrangements can be made for the hiring of the initial equipment during the adjustment and operation of which final decisions can be made both as to the technical layout and disposition of the units and its suitability for the particular location and application. In the light of recent experience there is little doubt that fluorescent floodlighting is the medium of the future.

ASSOCIATION OF PUBLIC LIGHTING ENGINEERS

1,100 Attend Brighton Conference

TUESDAY morning saw the opening of the annual conference of the Association of Public Lighting Engineers, when nearly 1,100 delegates attended the Annual General Meeting in the Dome at Brighton. There followed the induction of the new President, MR. H. PRYCE-JONES, M.ENG., M.INST.C.E., M.I.E.E., M.INST.F., the Mid-Sussex sub-area manager of the S.E. Electricity Board, after which the Mayor of Brighton, ALDERMAN ERIC SIMMS, J.P., officially opened the conference.

The Presidential Address

Opening his Presidential Address with a brief reference to the historical aspect of street lighting (including the use of Christians soaked in oil by the Emperor Nero), the President drew an interesting comparison between Brighton's present street lighting bill of £40,258 for 6,694 lamps with the accounts for 1853, when 947 lamps cost £3,923 for upkeep and maintenance.

Mr. H. Pryce-Jones

Turning from the historic past to the active present, he mentioned a protest made last year in the Open Forum, against too great a measure of standardisation in lighting practice. While he deprecated the reduction of the art of street lighting to the mere installation of "off the shelf" equipment, the desire for individual choice should not overrule the duty to the man in the street. Variety was said to be the spice of life, but the street lighting dish was apt to be over-seasoned! Better and more uniform lighting standards could do much to reduce accidents and crimes against property and person, and the problem of obtaining this improvement without taking away discretionary powers from the lighting engineer could be approached under three main heads: the establishment of standards of lighting uniformity; improvement in equipment quality and reduction in variety of types; and some means of co-ordination to avoid violent changes in the type and/or colour of the lighting in adjacent sections of the same road.

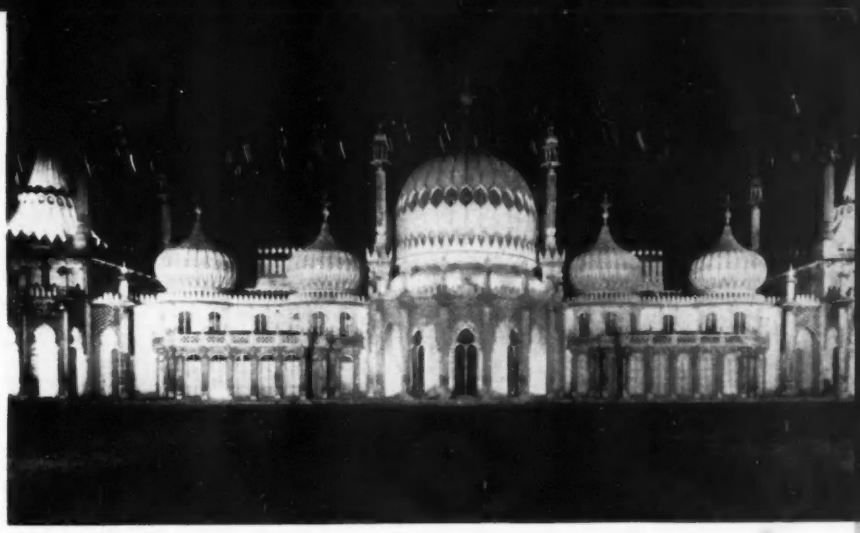
The 1937 Report of the Ministry of Transport and the new Code of Practice provided guidance on the first point. Regarding the second, there was undoubtedly too great a range of equipment in common use—which was abundantly demonstrated by the displays associated with the Conference. Although optical considerations should help to provide a common denominator in lantern equipment, it was amazing what ingenuity was exercised to make something slightly different. Simplification could be achieved by reduction in variety and should bring lower costs in its train.

Quoting the Lemon Report on the difficulty of obtaining agreement on standards due to the number of interested parties, he pointed out that difficulties frequently arose because, although the manufacturers usually had their trade associations, there was no one to represent the user, and he felt that in this field the Association was well suited for such a role, and he suggested that provincial centre meetings could discuss local as well as national problems, submitting proposals to be considered by functional committees set up by the Association. Local authorities could assist greatly by allowing their staff to serve when invited.

Regarding the co-ordination of lighting, he felt that it should be possible for adjacent lighting authorities to come to some agreement to avoid abrupt changes, and this matter needed serious considerations, lest the matter were taken out of their hands and statutory regulations created, in this world of ever-increasing restrictions and replacement of Whitehall for the Town Hall.

On the progress of the Association, he pointed out that the revision of Articles, which had permitted the gas and electricity industries and manufacturers to become full members had greatly strengthened the Association and broadened its fields, the total membership being now 617. Work was proceeding towards the establishment of a diploma in public lighting and it was expected that examinations would be held in 1953 or early in 1954.

On the subject of future developments the President said that electricity might some day become outmoded by harmless atomic radiations or fluorescent phosphors excited with



An interesting item of the tour on Wednesday — the Royal Pavilion floodlit by B.L.E.E. Co. long-range mercury floods

short-wave radiation. Whatever remarkable changes were in store, the A.P.L.E. would continue to play an increasingly important part in their practical development and commercial application.

Maintenance Methods

FIRST technical paper read to the Conference was "Maintenance—Organisation and Methods," by MR. C. C. SMITH, A.M.I.E.E. (City Lighting Engineer, Liverpool), who described the methods by which his 30,000 lighting positions were serviced. Many controversial topics were raised including the question of nightly patrol favoured by the author, hand-wound and hand-set time switches, and group replacement of lamps v. sporadic replacement.

Mr. C. C. Smith

On the general aspect of the subject, the author emphasised the extent to which careful thought and planning in the first place could affect the maintenance required. A striking example given was an installation for side street lighting in an industrial neighbourhood. By utilising wall lanterns of simple and robust construction, not only was access easier but malicious damage—particularly by stone-throwing—was considerably reduced. Interesting comparisons between the relative advantages of steel and concrete standards were also made and some types in use in his own area were described. He considered it inadvisable to utilise steel brackets with concrete columns, the finished article appearing "the combined work of the engineer and the architect and the completed and designed work of neither."

One could, he felt, go into considerable detail on the design of lanterns from a maintenance point of view. The tiny set screw which required removal, while perched on a ladder on a windy night, the serrated refractor needing cleaning with wire brush and special solution, the clamping ring which allowed the optical system to fall out at the critical moment, were some classic examples. Comparing the ease of cleaning of the open type lantern with the better preservation of the closed pattern, he felt that from a pure maintenance point of view the open lantern was to be preferred. The ideal of equipment which could be fitted and forgotten was, in his opinion, overdrawn—there was much to be said for regular attention to all equipment within economic limits.

Four methods of control equipment—manual, hand-set time switches, electrically wound time switches with solar dials, and centralised control by injected signals—were then compared and figures given for relative costs, with a view to stimulating discussion. He believed that the rapid universal application of centralised control would depend on the Area Boards installing the equipment for system control and hiring out a control service to local authorities on a basis of so much per point per annum.

Under the heading of accessories, a number of details were dealt with, including enclosed transformers, locking devices to base compartments, and on the question of erection several devices developed by his own department for simplifying overhead erection.

The latter part of the paper dealt with the organisation of his own department in Liverpool with particulars of personnel and their equipment, an analysis of maintenance costs, and particulars of emergency work found necessary throughout the year.

Four Problems on Main Roads

WEDNESDAY'S first paper, by MR. W. R. STEVENS, B.SC., M.I.E.E., F.I.E.S. (G.E.C. Research Laboratories) was another paper aimed at promoting discussion rather than laying down principles. Entitled "Four Problems in Traffic Route Lighting," it dealt first with a general comparison between cut-off and non-cut-off systems. Non-cut-off systems had tended to gain the day before the war on relative costs. Wartime blackout conditions had made people more light-conscious and there seemed to be not only a determination to have better lighting, but a preparedness to pay for something a little better than the minimum.

Mr. W. R. Stevens

Illustrations were shown of the build-up of both types of installation, showing that cut-off lanterns give a relatively wide patch of light extending only a short way along the road, whereas non-cut-off distribution gives patches extending several hundred feet towards the observer. In both cases lanterns must be sited so that the bright patches overlap, giving a uniform road brightness. Spacing distance was much more rigid in cut-off installations, the general characteristics being as shown in Table I. This however, could not do justice to many fine points of difference between the two systems since many factors would alter according to the particular installation. Central mounting required by cut-off installation would be more expensive if suspension were required, while on dual carriageways, cut-off lanterns mounted on the central reservation might be cheaper. Relative annual costs of two installations for 250 W mercury lanterns, the non-cut-off type, mounted at 120 ft spacing (staggered) and the cut-off lanterns centrally suspended at 90 ft centres were given as £840 and £1,161 per mile respectively on the basis of no supply existing prior to the installation.

TABLE

Characteristics of Cut-off and Non-cut-off Distributions

Arrangement	Cut-off Central Mounting	Non-cut-off Generally staggered
Spacing	90 ft (rigid)	120-150 ft (flexible)
Road Brightness	Lower	Higher
Glare	Lower	Higher
Kerb Visibility	Possibly poor	Possibly better
Cost	Possibly higher	Possibly lower

The road surface brightness for a cut-off installation might be about one-third that of a non-cut-off installation, but this was largely offset by reduced glare. Against this was the fact that each lantern gave a flash on the windscreen of a passing car, and cut-off installations frequently failed to reveal the kerb. Furthermore, non-cut-off installations might give some discomfort glare, but the disability glare was negligible. The pros and cons of the two installations were nicely balanced, in fact, and it was not possible to claim outstanding advantages for either. The obvious course was, therefore, to attempt a compromise and many distributions had been designed known variously as "semi" or "controlled" cut-off but which were now recognised in the B.S. Code as "medium angle" beam, aiming at a maximum intensity between 70 and 80 deg. to the vertical, falling off rapidly as the horizontal was approached. Another method of reducing glare was by increasing the area of the light source. Fluorescent street lighting in spite of its high cost was becoming very popular.

Lighting of dual carriageways was the next problem. The orthodox method of treating each half as a separate road resulted in a constellation of lights and half the light was wasted, being emitted in the direction of the traffic flow and therefore not only failing to increase the road brightness but actually reducing the silhouette effect. Unidirectional lanterns had much to recommend them—objects were seen as strong black silhouettes even when of light colouring, the other half of the road was quite free from distracting lights, and a given brightness could be obtained with rather less than half the power. Cut-off lighting had recently emerged as a powerful alternative. A further method as yet untried was a unidirectional cut-off system which, to counterbalance the advantages, would require twice as many lanterns as a normal cut-off system. Centrally-mounted non-cut-off lanterns were a further compromise. Relative costs were given for staggered lanterns at 120 ft with 250W lamps; unidirectional lanterns at 120 ft with 125 W lamps and 250 W centrally mounted cut-off installations at 90 ft spacing: the res-

(On right) Preston Village, lit with 3-light "Multilite" cut-off lanterns at 90 ft spacing and 25 ft height. Max. beam at 68 deg. Cut-off at 80 deg. Width of road, 40 ft between kerbs

(Below) Trafalgar Street, Brighton, a 32 ft road lit by 3-light (2-100 W, 1-150 W) "Multilite" cut-off fittings at 90 ft spacing and 25 ft height. Max. beam at 68 deg. Cut-off at 80 deg. Tarmac road surface

SOME HIGHLIGHTS OF WEDNESDAY'S TOUR OF BRIGHTON LIGHTING

(Below) The B.T.H. Mazda fountain in Valley Gardens

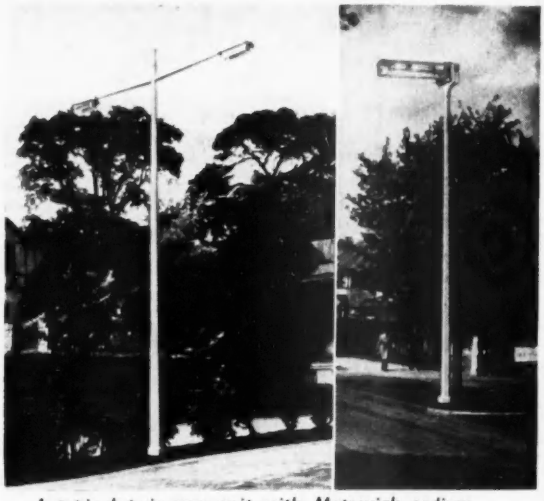
pective annual costs per mile being £1,469, £1,148, and £1,011 on a basis of no supply existing prior to the installation.

On the lighting for roundabouts—the third problem—a number of methods of revealing kerbs clearly were reviewed, the author pointing out rather drily that many methods appeared excellent on the plan of a convenient roundabout design, each lantern performing several useful functions—but a motorist did not see a plan view, and few roundabouts have convenient designs. While it was simple to light a roundabout so that it was satisfactory to those already negotiating it, the problem of revealing its existence and pattern to a motorist approaching at high speed was a different matter.

The fourth problem set out was that of co-operation between highway and lighting engineers. If road illumination was poor, the lighting engineer got the blame, but if one's living room were painted dull black no one would expect the lighting to make it bright and cheerful. It might be argued that the prime object of a road was to provide a non-skid surface but there was no reason why the reflecting power should not be studied more closely by those responsible.

MANUFACTURERS AT THE CONFERENCE

THIS year, there is no indoor exhibition with individual stands, the major portion of the commercial interest being centred on the outdoor display in Madeira Drive. For the convenience of visitors, we are listing in alphabetical order the arrangements made by many manufacturers to keep in touchwith their friends.



A typical twin-arm unit with Metrovick sodium lanterns and a side mounting unit with Siemens fluorescent lantern, both by Poles, Ltd.

B.L.E.E. Co.

This year the Brighton Lighting and Electrical Engineering Co., Ltd., might almost adopt Wren's inscription in St. Paul's: "If ye seek his monument look around you," since the tour of lighting installations which delegates take on Wednesday night includes a large number of their cut-off lanterns, the P.J. "Multilite" which, fitted with three tungsten lamps in line, was developed in conjunction with Mr. Pryce-Jones. Two lanterns are also exhibited in the outdoor display.

B.T.H.

Main item of interest this year (apart from the Mazda Fountain which forms part of the tour of inspection) is a new "open" lantern for sodium lamps which is suitable for either top or side cable entry. Constructed almost entirely of "Perspex," it has sealed refractors and is expected to eliminate many maintenance troubles associated with exposed metal parts. Reduction of maintenance to a minimum has also been the aim in the improved versions of "enclosed" pattern sodium and mercury lamps, the latter now utilising a horizontal lamp without magnetic control.

Concrete Utilities, Ltd.

The selection of poles in the outdoor display represent the wide range available, including two of the latest designs for fluorescent lanterns. A special feature is the range of finishes to harmonise with different types of setting.

Crompton Parkinson, Ltd.

Featured in the outdoor display are two side entry "Corona II" 140 W enclosed sodium lanterns mounted on a Concrete Utilities "Avenue 3D" column and two side entry "Capella II" open type lanterns for the same lamps, on an "Adastra" hexagonal column by Poles, Ltd. A "Taurus" side road lantern is also shown on a Stewarts and Lloyds "S" steel column.

In addition to the outdoor display, there will be a conference room open daily at the Hotel Metropole where a number of new and improved items can be seen.

Edison Swan, Ltd.

Shown in the outdoor exhibition are the A.S.14 300/500 W tungsten and the A.S.13 250/400 W mercury lanterns, both being for main road lighting. For side road lighting the BT20 is being shown, suitable for 60-200 W tungsten lamps.

E.L.E. Co.

The Engineering and Lighting Equipment Co., Ltd., have a display in a private room at the Bedford Hotel, where they are showing two new lanterns, the "Golden Ray" Marks I and III. Both are for sodium lamps, the first being an "open" unit with "Perspex" panels, and the second having a die-cast body and a "Perspex" bowl. Both have sealed-in machined prism units, and interesting N.P.L. test results have been obtained. Several other lanterns are also on show, together with their well-known lowering gear.

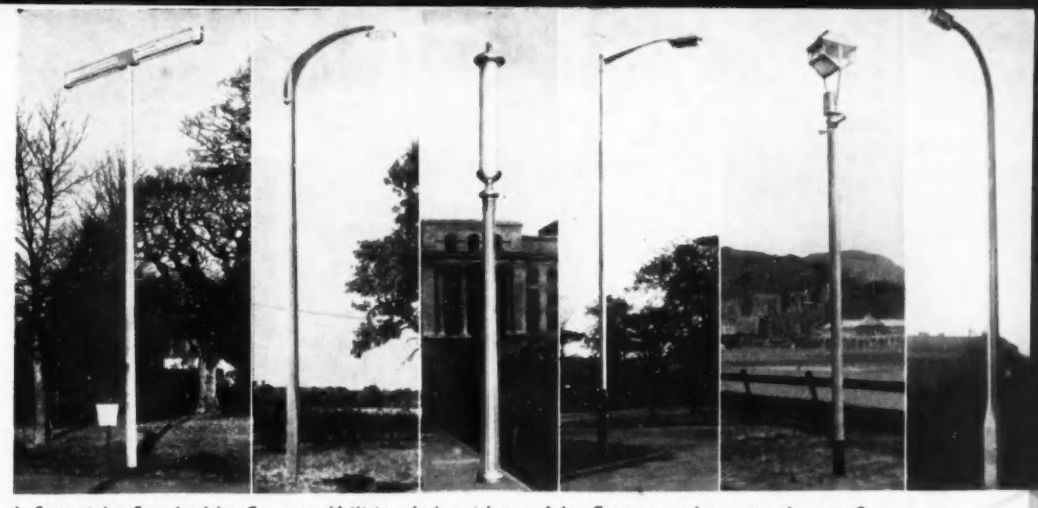
Falks

Items on view in the outdoor display include the "Dragon" lantern which is in cast aluminium with an interior-prism bowl refractor, this being mounted on a Stewarts and Lloyds G.b. 811 steel column, and a Fulmar I sodium lantern on a Stanton concrete column. The Fulmar is an "open" type, largely constructed in "Perspex" and aluminium alloy.

G.E.C.

A development of special interest by the General Electric Co., Ltd., is the design of two new sodium lanterns intended for gas conversion schemes, where the existing columns are not provided with chambers for the auxiliary gear. These have been developed in two sizes, one for 85/140 W lamps and the other, for 45/60 W lamps, intended for side road lighting. Both are arranged to accommodate the auxiliary gear in the roof of the lantern.

Other items on view include two decorative lanterns for vertical fluorescent tubes, one for



Left to right: Standard by Concrete Utilities, Ltd., with two Atlas fluorescent lanterns; the new Stanton class A spun prestressed standard; Revo "Festival" column and lantern; Stewart and Lloyds curved single-arm, type G.b. 587; Stewart and Lloyds G.b. 517 13 ft tubular column; Revo "Scopas" unit with narrow base for restricted thoroughfares

4-5 ft. lamps and the other for 4-2 ft. 20/40 W lamps, the latter having the end caps, as well as the main enclosure, in opal "Perspex." The "Universal Dioptrion" lantern is also shown; for 250 or 400 W mercury lamps. This can be converted from one size to the other by changing one connection on the magnetic control, no other modification being required.

Holophane, Ltd.

The exhibit this year is limited to three units which are being displayed on standards made by the Revo Electric Co., Ltd. The new cylindrical sodium lantern, a prototype of which was seen by some delegates at last year's exhibition, is now in production. The cylindrical refractors are capable of rotation to allow of the light distribution being adjusted to suit road gradients. The "Post Top" unit, and the "Acorn" unit arranged for side entry are also being shown. The "Acorn" is suitable for 750/1,000 W tungsten or 400 W M.A.F./V lamps, and has internally moulded prisms, with a body of cast aluminium; it was selected by Lambeth Borough Council for York Road, the main entry to the Festival.

Holophane 'Post-Top'

Horstmann Gear Co., Ltd.

No formal private exhibition of time switches is contemplated, but Mr. E. C. Sheppard (Bedford Hotel), the representative of this company, has a number of models with him which may be of interest to delegates.

Metropolitan Vickers, Ltd.

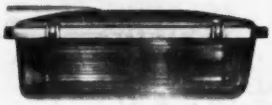
Following their successful introduction of the "S.O. Fifty" in 1948, the Metropolitan Vickers Electrical Co., Ltd., are showing for the first time a companion, the "S.O. Fifty-Two," an open type lantern with a "Perspex" hood with sealed-in refractors, the top of the hood being opalised to give a pleasing night-time appearance while re-directing the major portion of the light downwards. The cantilever casting supporting hood and lamp is in LM6M aluminium alloy, and the lantern for 85/140 W sodium lamps is arranged for side entry. Other lanterns on view include the "S.S. Fifty-One" for mercury or tungsten lamps, and the "Borough" for two 2 ft. fluorescent tubes, both these being designed for Group "B" roads.

Poles, Ltd.

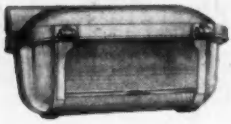
The exhibits in the outdoor display comprise a typical selection from the "Adastra" sectional steel columns in circular and hexagonal form, in a number of mounting heights, particular emphasis being laid on the compact "nesting" of the components for transport, so that a complete unit is no larger than its largest section.

Revo Electric Co., Ltd.

New additions to the "Revo" range of lanterns include the C13594, a new version of the "Silverblue" for top or side entry. Fitted with stainless steel reflector and suitable for mercury lamps, this unit is suitable for central mounting on dual carriage-ways as well as normal roadside siting. A new sodium lantern, the C13723, with a one-piece "Perspex" bowl and sealed-in refractors, and a new cut-off lantern, the C13654, for mercury lamps, achieves robust construction and simplicity of maintenance. Other interesting features are the C13612, an ornamental lantern for two or four 2 ft. vertical fluorescent lamps designed to eliminate shadows at the column base, and the

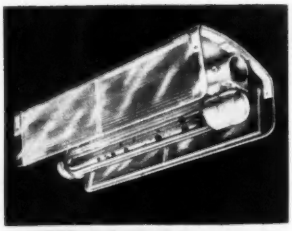


E.L.E.Co. Golden Ray Mark III

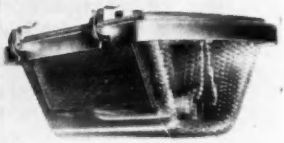


Revo C.13594 "Silverblue"

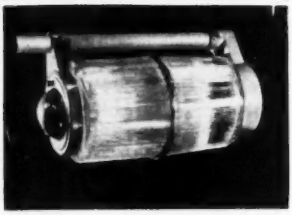
Revo C.13654 cut-off pattern



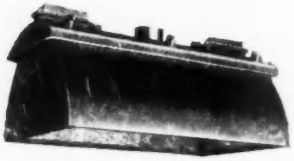
Metrovick "S.O. Fifty-Two"



G.E.C. sodium lantern for gas conversion



Holophane cylindrical sodium



On right: G.E.C. decorative lantern. Above: B.L.E.E. Co. "P.J." cut-off lantern

new Festival lantern and cast-iron column for four 5 ft. fluorescent tubes with cylindrical "Perspex" cover and aluminium canopy and base.

Standards shown include the "Phidias" (Group A) and "Myron" (Group B) together with the "Scopas" and "Angelo," two new columns with special narrow bases for restricted thoroughfares. Steel and cast-iron columns include the "Regal," "Vanguard" and "Woolwich" patterns.

Siemens Electric Lamps and Supplies, Ltd.

Most interesting item of new equipment is a new "Sieray" sodium lantern that embodies the Holophane drum refractor, which is combined with the vacuum jacket of a standard sodium lamp to form a sealed unit, and is fixed into an aluminium casting by two rods holding the unit together. Other exhibits in the open air display include both large and small fluorescent lanterns, the "Wilton Sieray 3480" on a steel column and the "Wilton 240" group B unit on a concrete column. The "Sola Sieray" for 85/140 W sodium lamps and the "Easton Sieray" and "Weston Sieray," two mercury lanterns, are also shown.

Simplex Electric Co., Ltd.

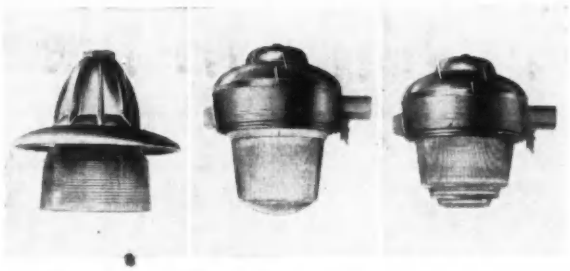
A comprehensive display of lighting equipment, including three fluorescent fittings, a reflector flood, the "Neo Displex" reflector, the "Fiesta-Flood," a general purpose floodlight, narrow beam and long range floodlights, is on view at the Service Centre of the South Eastern Electricity Board in Castle Square.

Stanton Ironworks, Ltd.

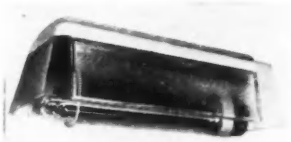
One of the most interesting items of the whole exhibition is the combination of spinning and prestressing in concrete pole manufacture, of which examples are shown in two sizes, and the remarkably slender appearance of the new class "A" column is illustrated on another page. Other examples shown include designs passed by the Royal Fine Art Commission. The well-known Stanton chamber door and locking device is also shown.

Stewarts and Lloyds, Ltd.

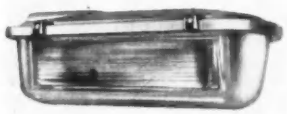
The range of steel columns exhibited in the outdoor display includes four main types: bracket



Left: Ediswan A.S.14, A.S.13, and B.T.20. Below is the new Mazda "Open" sodium



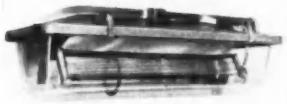
arm and shepherd's crook for main traffic routes (25 ft) and swan-neck and pillar type suitable for class "B" roads of 15 ft and 13 ft mounting heights, examples of plain and fluted columns being shown. Most of the designs have been passed by the Royal Fine Arts Commission.



The Crompton Corona II

Thorn Electrical Industries, Ltd.

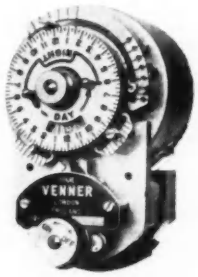
Main exhibit in the outdoor display is the Atlas PLQ/3080 lantern for three 80 W fluorescent tubes which is shown on a standard by Concrete Utilities, Ltd. Floodlighting of the Royal Albion Hotel illustrates recent strides in outdoor fluorescent floodlighting developments, as does the Steine fountain, which forms part of the delegates' tour on Wednesday night.



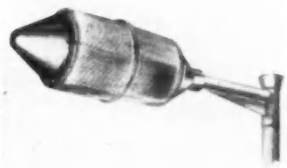
Mazda "Enclosed" sodium

Venner Time Switches, Ltd.

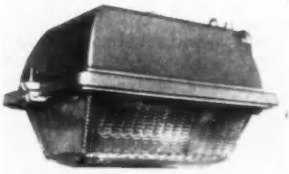
A representative display of time switches can be seen at the Metropole Hotel, and will include the new T.J.S.P. model, specially designed to overcome the problems of power cuts, and eliminate the necessity for re-setting of synchronous switches. It has an eight-hour spring reserve with synchronous motor winding, a new design of solar dial capable of very accurate settings, is of the plug-in pattern and its dimensions in the normal dustproof box are $4\frac{3}{16}$ in. × $4\frac{3}{16}$ in. × 7 in. high.



The Venner T.J.S.P.



Sieray circular sodium



Mazda enclosed pattern "Mercra"

Wardle Engineering Co., Ltd.

Main interest this year is concentrated on two exhibits in the outdoor display. First is the "Melville" lantern for group "A" roads, with 250/400 W mercury lamp and silvered glass prismatic reflector, the refractor being a one-piece rectangular bowl, this lantern being shown on a Stewarts and Lloyd's steel column. For Group "B" roads, the "Palatine," a 100/200 W tungsten top-entry unit with an open type one-piece refractor is shown on a Stanton concrete column. This lantern is also available for 300/500 W tungsten or 80/125 W mercury lamps.

Holophane "Acorn"

overseas news

The Power Ship Question

The question of purchasing a floating power station has been discussed by the New South Wales Electricity Commission, but it was decided that until further information on the estimated annual running costs and other details were available, the matter should be left in abeyance. The commission has had two proposals for a power ship from the United States. One from the International General Electric for a 20,000-kW generator mounted in an 8 ft-draught barge, would cost £2,400,000. The earliest estimated delivery date, with a two months' delay for approval for the dollar expenditure, was stated to be September, 1953. The other proposal from Westinghouse was for a Liberty ship carrying a 30,000-kW generator. Some officials of the Commission have recommended that the plan for a power ship be scrapped, because apart from being costly, by the time they were ready, the existing construction programme would provide another 400,000 kW. It is also proposed that the Commission should take over emergency generating plants installed by individual firms, so that they would be used at all times instead of periodically.

Mr. Conde Returns

Just back from his plant-buying mission to Britain, United States and Europe, Mr. H. G. Conde, chairman of the Electricity Commission of New South Wales, said the U.S. had granted the highest defence priority for 190 MW of generating plant for Australia, of which 140 MW would be for New South Wales. In addition, N.S.W. would get 700 MW of plant from the United Kingdom mostly steam plant for new power stations. He believed the U.S. was the best place to get plant from expeditiously: there might be more difficulty in getting it from the U.K. because of the shortage of steel and shipping space. He also referred to offers from Japan.

Plant for Offer

A Japanese concern has a complete 150,000 kW generating plant available, the New South Wales Electricity Commission has been told. The plant was originally manufactured for China before the Korean war, but authorities have since refused to permit the shipment of the machinery. The Commission is making inquiries into the matter, but the question is asked "What about the associated boilers?".

Fremantle's Supply

Conditions under which the Fremantle Electricity and Tramways Board was at present obtaining electricity from the State Electricity Commission of Western Australia were not considered tenable and equitable, the Minister for Electricity (Mr. Brand) stated in the Legislative Assembly recently. He was replying to further questions on whether the Fremantle district was to remain on a 40-cycle frequency or be included in the change-over to 50 cycles in the metropolitan area. Under an agreement made in 1916, expiring in 1967, the board received electricity at a little over half the actual cost of generation today. As a result, the Commission was losing about £90,000 a year. This loss might increase to £150,000 a year in 1956 and £240,000 in 1961. Negotiations were proceeding between the Fremantle board and the S.E.C. with a view to amending the conditions imposed by the agreement and he hoped a satisfactory solution would be found. Failing this, the Government proposed to submit the agreement for review by Parliament, the only authority with power to amend it.

Sydney's Loss

Sydney's County Council's sales of electricity to the public for the first seven months of the year have fallen 73 million kWh below estimated sales, it was stated at a recent council meeting, when alarm was expressed at the loss in revenue. Expenditure had exceeded the estimates by £750,000 it was reported. Councillor Jensen said that in July the council sold 794 million kWh—12 million kWh fewer than expected while expenditure rose £41,000 above the estimates for the month. The chairman, Councillor W. P. Henson, agreed that sales to the public for the first seven months of the year had fallen "very disturbingly," although the council had increased its sales to other supply authorities. It was decided to confer with the general manager, Mr. C. J. Craggs, about the effect of the reduced sales.

Rationing in Tasmania

More drastic rationing of power to all consumers in Tasmania is necessary, according to the Parliamentary committee which investigated the State hydro-electric system. Their report, tabled a few days ago, emphasises that the greatest economy by bulk consumers, commercial and domestic users must be insisted on, and that power rationing must be maintained at least until 1954. There could be no substantial improvement before the four machines in the Tungatinah scheme come into operation.

Calculations of likely demands of all types of power users showed that with Tungatinah and Trevallyn stations coming into operation in 1954, the annual demand again would exceed the power supply by 1955. With the addition of Lake Echo and Wayatinah schemes, the system should meet estimated demands until 1959 or 1960.

The lag in power development was not attributable to the present administration of the Commission, the committee decided. The report also stressed the seriousness of the water supply system in Great Lake and Lake St. Clair, the rapid depletion of which had placed the State's hydro-electric system in a precarious position.

Rural Electrification

About 3,500 more Alberta farms will be served with electricity this year, bringing the total up to 15,700. Calgary Power Ltd., is serving about 10,000 farms and will add 3,000 more this year if plans can be carried out before the freeze-up. Canadian Utilities Ltd., of Edmonton, served 2,029 farms at the beginning of the year and will add 600 to 700 this year.

And over in Manitoba the Power Commission connected 340 rural consumers during June and about 980 during July.

Prophecy

Canada in 1960 will be a country of 16,000,000 people, 750,000 more houses, over 300,000 more rural electricity consumers, 1,000,000 television sets and, wonder of wonders, community-wide garbage disposal by means of a unit which grinds up food waste at the sink and washes in away. These predictions, and more—including a working St. Lawrence seaway and power project—were made recently by H. M. Turner, president of the Canadian General Electric Co. But if these things were to come to pass in nine years, industry must plan and act decisively now, if Canada is to achieve fully her destiny as one of the great nations of the world, he urged.

Genissiat Expansion

The fifth 65,000 kW generator at the hydro-electric power station at the Genissiat dam, on the Rhone, not far from the Swiss frontier, was put into commission by Electricite de France last weekend. The total capacity of the station is now 270,000 kW. Eventually there will be a sixth 65,000 kW unit installed, but this will not be ready for some time yet.

Trade Examinations

The committee set up recently to examine the question of the establishment of an All-India Trade Certification Board began its work in Delhi recently under the chairmanship of Mr. M. Anantasayanam Iyengar. At the present time the various industrial undertakings and technical schools conduct their own examinations, but the certificates issued are not valid throughout India. It is to remedy this that the committee has been set up. The committee is to submit proposals for the establishment of an all-India Trade Certification Board, covering craftsmen in engineering and building trades, and make recommendations as to what interim arrangements should be made pending the establishment of the Board.

Extension Plans

Ratepayers of Graaff Reinet Municipality, Cape Colony, have approved the raising of loans of £23,609, the increased cost of the power station extension scheme, and £11,500 to cover the cost of extending the electricity distribution system south of the Sundays River.

Singapore's Troubles

The serious power shortage in the island was the subject of discussion at a recent meeting of the Singapore Municipal Commissioners when it was eventually decided to await the interim report of a committee appointed last January to inquire into means of supplementing the supply of electricity pending the building of the Pasir Panjang power station. Earlier one member had moved that the Government be requested to remove restrictions on the purchase of essential plant from countries outside the sterling area. His motion asked that the Commission "view with concern the rapidly deteriorating position of its electrical undertaking," and that it should recommend "that immediate steps be taken to supplement the existing plant at St. James' Power Station." He traced the problem back to 1940 and outlined the various steps which had since been taken to alleviate the position, stressing that various delays had caused postponement of delivery dates. Reference was also made to a 20 MW set ordered in 1941, for delivery in 1943, of which no further news was heard. But we understand that this order was subsequently amended for a 25 MW unit. Nevertheless, Singapore is seriously afflicted with power cuts, and, pending the commissioning of Pasir Panjang, all means of avoiding increasing trouble are being considered.

Montevideo Contract

Thirteen foreign firms have put in tenders in connection with the extension of the Jose Batlle y Ordonez power station at Montevideo for the Uruguay Government, we understand. It is understood that of these 13 foreign firms three were British. The companies concerned being the Mitchell Engineering Group, who submitted an estimate for turbines and boilers in collaboration with the English Electric Co. Ltd.; Metropolitan-Vickers Electrical Co. Ltd. in collaboration with Babcock and Wilcox Ltd.; and Simon-Carves Ltd. together with the General Electric Co. Ltd. It is also understood that the Mitchell Engineering Group submitted a tender from the civil engineering works through their local agents. Value of the contract runs into seven figures, but the name of the successful contractor is not expected to be divulged for some months.

PERSONALITIES

IN THE INDUSTRY

Shortly moving from North West Scotland to Nigeria is **Mr. A. Earls,** B.SC., M.I.E.E., A.M.I.Mech.E. Now area manager for Cowal and Bute to the North of Scotland Hydro Electric Board, with headquarters at Rothesay, Mr. Earls has accepted an appointment as chief engineer of the newly formed Electricity Corporation of Nigeria, and is to leave for Lagos within the next few weeks. Educated at Queen's University, Belfast, he gained early training with Metropolitan-Vickers Electrical Co. Ltd. before taking up the appointment of burgh electrical engineer at Rothesay in 1937. He became area manager, Bute and Cowal area for the North of Scotland Board on the transfer of the Rothesay undertaking to the Board in 1946.

Mr. A. Earls

Formerly sales manager to Cyc-Arc Ltd., **Mr. R. W. Taylor,** A.M.I.E.E., takes up an appointment on October 1 with Crompton Parkinson Ltd., as product sales manager of the Nelson stud-welding service. Before joining Cyc-Arc he was sales manager and director of the Power Equipment Co. Ltd. from 1945-48. During the period 1938-45 he was a senior technical officer of the Ministry of Aircraft Production and in the Air Ministry, previously having been director and works manager of Murwood Ltd. and Bejay Engineering Co. Ltd. from 1936. He completed a three-year student apprentice course with the B.T.H. Co. Ltd. in 1931, and served in various sales departments of that company for five years. Mr. Taylor takes over the position of product sales manager, Nelson stud welding, from **Mr. R. V. Powditch,** O.B.E., T.D., A.M.I.E.E., A.I.Mech.E., who, as previously announced, becomes product sales manager, Crompton Parkinson F.H.P. motors, on October 1.

Shortly to retire from the position of controller of the London Division of the B.E.A., **Mr. J. N. Waite,** C.B.E., M.I.E.E., F.Inst.F., has agreed to advise the Electricity Commission of New South Wales on the operation of power stations to be taken over from the Sydney County Council and other authorities. This information was given in Sydney last week-end by **Mr. H. G. Conde,** chairman of the Commission, on his return to Australia after visiting many countries, including Britain and the U.S.A. Mr. Waite's new post, we understand, will entail an extended visit to Australia in the near future to carry out an investigation.

The end of next month will bring the retirement of an eminent engineer, internationally known for his extensive contributions to the art and science of illuminating engineering. We refer, of course, to **Dr. J. W. T. Walsh,** O.B.E., M.A., D.SC., M.I.E.E., who relinquishes his position of senior principal scientific officer of the Electrical Department of the National Physical Laboratory on October 31. Dr. Walsh first made an extensive investigation into industrial lighting for a Departmental Committee on Factory Lighting back in 1913, since when he has taken a very active part in the development of education in the lighting profession. He has served on many Government Committees on various aspects of illumination and is also author of a number of works on lighting and photometry. He also holds the distinction of being the only person to have twice held the office of President of the Illuminating Engineering Society. In the course of his long association with the Lighting Industry, Dr. Walsh, by his charming disposition, has made an enormous number of friends, and many assembled at Brighton for the A.P.L.E. conference this week will join us in wishing him a long and happy retirement. For, although officially he is retiring from the N.P.L. we hope that we shall continue to see him at I.E.S. functions for some time to come.

Dr. J. W. T. Walsh

Mr. A. Shelton and **Mr. J. W. Reid** have retired from the board of Berry's Electric Ltd. Mr. Shelton has served as a director for twenty-three years and Mr. Reid for seven. To fill their places on the board, **Mr. J. J. Thompson,** sales manager, and **Mr. B. H. Killinger,** Wembley works manager, have been elected directors of the company.

Mr. J. J. Thompson

Mr. B. H. Killinger

Aberdeen's electricity chief for the past 14 years —first as city electrical engineer and latterly as area manager to the North of Scotland Hydro-Electric Board, **Mr. Alex Gardner,** B.SC., M.I.E.E., F.R.S.A., is to retire on December 31 after more than 39 years' service in the city's electricity supply undertaking. He received technical education at Manchester University, and gained experience with Burnley Corporation electricity undertaking and with the Lancashire Dynamo and Motor Co. before going to Aberdeen in 1912 as a junior engineer. Between 1912 and 1937 his duties included those of district engineer in charge of mains and he was also responsible for all work in the Deeside suburban area. In 1937 he was promoted from development and substation engineer to the post of city electrical engineer. Mr. Gardner takes an active interest in local business circles; he is a past president of the Aberdeen Business and Professional Club, and past chairman, and honorary vice-president of the Aberdeen Mechanical Society. He was the first chairman of the enlarged North East Scotland sub-centre of the I.E.E. and is still a member of the Engineering Committee of the Governors of Robert Gordon's Technical College.

Mr. Alex Gardner

Sir Henry Tizard, Sir Rowland Smith and **Mr. J. F. Lockwood** have been appointed to the National Research Development Corporation. Sir Henry has had a distinguished career as a Government scientist; Sir Rowland is chairman of the Ford Motor Co. and Mr. Lockwood is managing director of Henry Simon Ltd. and a director of other engineering concerns. Together with the re-appointment of those other members of the corporation whose initial periods of service recently expired the total number of members is brought up to 11. Chairman is **Sir Percy Mills.**

Formerly manager of the appliances and heating department of the Sun Electrical Co. Ltd., at Charing Cross Road, **Mr. H. J. Wright** has been nominated manager of the firm's new branch just opened at Wembley.

District engineer at Dewsbury for British Insulated Callenders Construction Co. Ltd., **Mr. A. H. Horsfield** has retired after 37 years service with the company. The occasion was marked by a presentation made at a social gathering attended by friends and associates. Mr. Horsfield joined the former Callender's Cable Construction Co. in February, 1914, having previously served as mains engineer to supply authorities at Uxbridge and Central Scotland. After the 1914-18 war he was on contract work in Lancashire but in 1920 went to Yorkshire and has been successively deputy district engineer and district engineer.

Principal representative of the Metropolitan-Vickers Electrical Export Co. Ltd. at Trafford Park since 1948, **Mr. F. R. Mason,** B.SC.(TECH.), has been appointed a director of that company. He started with the Metropolitan - Vickers Electrical Co. in 1926 as a college apprentice, and later spent several years on power engineering work. In 1938 he became engineer in-charge of the paper-mill section of general engineering dept. holding that position till 1948 except for two years, 1942-3, when he was seconded to the Ministry of Aircraft Production for work in connection with airborne electrical equipment. In 1945 he was appointed a member of the I.E.E. Committee on Safety Regulations for Civil Aircraft.

Mr. F. R. Mason

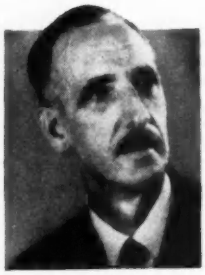
Babcock and Wilcox Ltd. announce that **Mr. C. H. Davy,** M.I.MECH.E., has been appointed works' director at Renfrew and Dumbarton works. Mr. Davy, who has been chief research engineer of the company since 1932, was appointed a director in July, 1947. **Mr. I. M. Lyon,** B.SC., M.B.E., M.I.MECH E., will continue in his present position as general manager of Renfrew and Dumbarton works. In addition, **Mr. T. B. Webb,** B.SC., A.M.I.MECH.E., has been appointed chief research engineer.

To older members of the Electrical Industry the name of **Mr. Alfred W. Beuttell,** M.I.E.E., will be associated with a number of enterprises—he was, for instance, the first chief engineer of the original (1906) North Wales Hydro Electric Scheme with its then only power station at Cwm Dyli, Snowdon. But he is more generally known as the patentee of the idea now called the double-capped tubular lamp—the "Linolite" system—which he evolved exactly 50 years ago—he is, of course, governing director of Linolite Ltd. The golden jubilee of that innovation was celebrated at Malmesbury recently when many old friends

Mr. A. W. Beuttell (right) receives his gift

and others interested in the work of the company during the half century attended a dinner at the Bell Inn. Among the visitors were **Mr. F. E. C. Miller,** director of Edison Swan Electric Co., **Mr. H. C. Weston,** hon. secretary of the Illuminating Engineering Society, **Mr. E. W. Grote,** managing director of British Electric Lamps, Ltd., and **Mr. A. R. McGibbon,** who had been Mr. Beuttell's technical assistant on many of his lighting projects. A specially designed 100 W Linolite desk light, mounted with silver-topped cut glass inkwells and silver pen tray, complete with silver pen and pencil, was presented to Mr. Beuttell by Mr. C. Gregory, the employee with the longest service (23 years). A further interesting feature of the proceedings was an exhibition of many early specimens of lamps, etc.

Mr. A. H. Harle, B.SC., A.M.I.E.E., has been appointed manager of a new sub-office of Metropolitan-Vickers Electrical Co. Ltd. which has been opened at 78/80 Hanover Street, Edinburgh, adjoining the company's already existing lamp stores. He was educated at George Heriot's School, Edinburgh, and Edinburgh University and joined M-V in 1925 as a college apprentice. After a short period in motor sales department he went to the Glasgow office where he specialised on the mining side of the company's activities. Mr. Harle is a past president of the West of Scotland branch of the Association of Mining Electrical and Mechanical Engineers.



Mr. A. H. Harle

Mr. W. T. H. Dart has recently joined the London office of Crypton Equipment Ltd. and has been appointed industrial sales engineer in the London area. He was previously with Siemens Bros. and Co. Ltd., Woolwich.

Mr. J. Bennett, A.M.I.E.E., has been elected to the board of Yorkshire Electric Transformer Co. Ltd. Chief designer of the company, he was previously a member of the senior design staff of the General Electric Co. at Witton and was earlier with Fuller Elec. and Mfg. Co. Ltd. and English Elec. Co. Ltd. **Miss P. Barratt,** secretary of the company for the past 26 years, has also been elected a director.

OBITUARY

Mr. R. G. Tyler, M.I.E.E., chairman of Tyler and Freeman Ltd., and one of the earliest electrical contractors, died on September 14, aged 88. He first formed his own contracting business in 1898.

Mr. A. Browne, M.I.Mech.E., J.P., a director of Davidson and Co. Ltd., died on September 15.

Mr. E. M. W. Boughton, M.C., manager of the Birmingham works of the British Thomson-Houston Co. Ltd., died on September 8, aged 64. He had served with the company since 1910 except for a short period in 1911, and during military service in the 1914-18 war.

Mr. J. Ward, of W. T. Glover and Co. Ltd., died on September 12 after 44 years' service with the company, for thirty of which he held the position of buyer.

The Merseyside Breakdown

AN official statement has now been received from the British Electricity Authority dealing with the recent breakdown of the power network in North West England. The facts are substantially as reported in the ELECTRICAL TIMES of September 6 but certain additional information has come to light. The gist of the statement is as follows:

At 4.57 p.m. on Monday, September 3, three heavily loaded grid connections supplying the Merseyside and North Wales Area and the Western section of the North Western Area tripped in cascade following an unexpectedly rapid rise in load. These connections were: the reactor at Percival Lane, connecting Percival Lane to Chester and Bromborough, the "tee" connection at Warrington, connecting Warrington to Wigan and St. Helens, and the Carlisle-Kendal line. The Dunston-Galashiels line, connecting the North Eastern Area with the South East Scotland Area also tripped. The Blackburn-Quernmore and Crewe-Percival Lane lines were out of commission for maintenance at the time of the outage.

The tripping of the lines referred to above isolated the area from the rest of the system, and the area demand was nearly 40% in excess of available generating plant capacity, the frequency and voltage in the isolated section thus fell rapidly.

Scotland was also isolated from England, but remained self-supporting.

An attempt was made to hold frequency by extensive load shedding but proved unsuccessful and generating plant had to be taken off due to loss of auxiliary power or instability. As the plant failed each station was cleared from the grid and local load restoration began as soon as generation could be resumed. By 5.28 p.m. all supplies in the area had been cleared from the grid and at 5.39 the isolated section of the grid was made live from the remainder of the system. Load was completely restored at 8.06 p.m.

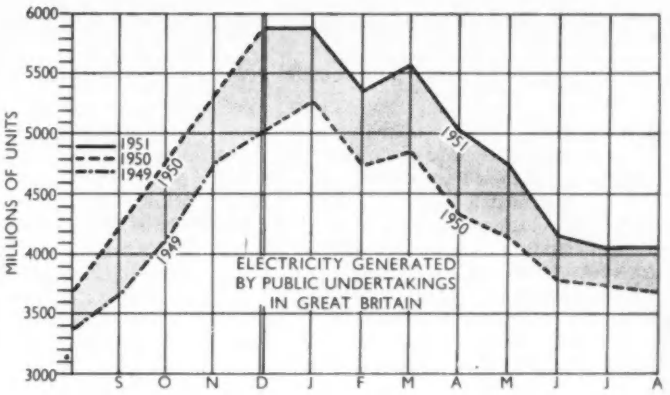
The statement refers to the fact that press reports mentioned that a number of fires occurred. The number of refrigerator motors burnt-out however was only four. As reports had been received of thirteen other refrigerator motor burn-outs in the year which were due to lack of maintenance by their owners, the Authority considers that the breakdown was not the prime cause of the four failures reported on this occasion.

UNITS GENERATED

4,068 million units was the total generated during August in stations under the control of the B.E.A., the North of Scotland H.E. Board, and the Lochaber Power Co. The corresponding figure last year was 3,738 million, so there has been an increase of 8·8%.

Of the total, 3,950 million units was generated in steam stations, and 108 million in hydro-electric.

Energy sent out during the month was 3,829 million units, 94·1% of that generated. This gives a total for the year up to August 31 of 36,721 million units, an increase of 12·4% on the corresponding period of 1950.



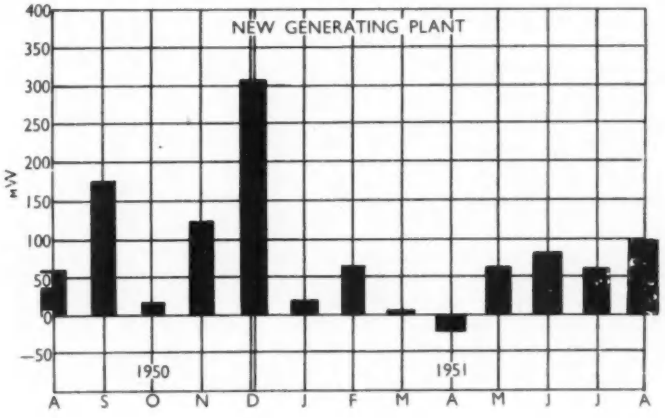
POWER SUPPLY IN AUGUST

SIXTH new station to come into operation during the current year is Westwood, at Wigan, in the North Western Division of the B.E.A. Ministry of Fuel and Power returns for August note the completed installation there of a 300 k lb/hr Babcock and Wilcox boiler. Present plans provide for five such boilers, and for four 30 MW B.T.H. turbo-alternators, giving an ultimate capacity of 120 MW.

Braehead (S.W. Scotland Division) which commissioned its first boiler in July, brought the first of four intended 50 MW Parsons sets into operation during August. The only other set mentioned in the August list is in another post-war station, Croydon in the South Eastern Division. It is the third of four 52·5 MW Metropolitan-Vickers turbo-alternators which are at present planned for installation there. At present three of the ultimate eight 320 k lb/hr Simon-Carves boilers are in commercial operation at that power station.

Water Power

Readers who have spent rather damp holidays this year may be wondering how the country's hydro-electric output is progressing under such apparently favourable conditions. In the first eight months of the year, the total energy generated by water power was 903 million units, an increase of 6·2% over the corresponding 850 million units of 1950. Of the 1951 total, 656 million kW/hr is credited to the North of Scotland area, and 248 million kW/hr to the B.E.A. The corresponding division last year was 568 million units and 282 million units, emphasising the effect of extra plant in the North of Scotland. August figures were respectively 78 million units and 30 million.



GENERATING PLANT

At the end of August, 1951, the installed capacity of the B.E.A. was 14,894 MW, showing an increase of 97 MW during the month. During the same period the North of Scotland total remained unchanged at 587 MW. The month's commissionings bring the overall increase during the past twelve months to 994 MW, or 6·9% of the August 1951 total.

The total installed capacity used for the purpose of this graph should be distinguished from the output capacity. The installed capacity is the total m.c.r. of all the generating sets which are connected on both steam (if appropriate) and electric sides, and are suitable for service.

ELECTRICAL ACCIDENTS - 1949

Factory Inspector reviews of trends of the year

SOMEWHAT longer than of recent years, and somewhat more expensive, "Electrical Accidents and their Causes," for 1949, has this week been issued by H.M. Stationery Office, price 2s. 6d. It has particular interest because it covers the first complete year of British Electricity Authority working, but there is also the usual useful review of factory electrification to help the works electrician.

Leading statistics for the year have already been published in the ELECTRICAL TIMES (p. 432, issue of March 15), but a further analysis in the present document emphasises the continued tendency of electrical staff to take unnecessary risks. The proportion of all reportable electrical accidents involving this group increased fairly steadily from 27% in 1944 to 50% in 1949. In the same period the total number of electrical accidents has decreased from 1,072 to 771.

Early experience of the B.E.A. operation of the supply industry suggested difficulty in locating the responsible executive officers, but on the other hand a greater willingness to agree with the Factory Inspectorate's views. Particular attention was paid to short-circuit MVA at various points in systems, and it was hoped that the new organisation would lead to more information being given to consumers on this important matter. This is regarded as a form of "consumer service," and another example placed in the same category was help over protection in areas having difficult earthing conditions. Differential current circuit-breakers have some advantages, and earth leakage c.b.s. are of course well established. In both cases maintenance presents difficulties, and in 1949 it was hoped that electricity boards might arrange for maintenance on consumers' premises.

Factories

During 1949 there was an appreciable improvement in availability of material for installation work, and many cases were reported where occupiers were making a marked effort to overhaul factory wiring and equipment. Efforts were made by the Factory Inspectors to interest less far-sighted managements, and some success achieved. This is considered of special importance in view of the advance in the number of electrically-caused fires during the last 15 years.

Once again, there is comment on the danger unnecessarily accepted by maintenance fitters in working on live, heavily-fused circuits, under the impression that if a flashover should occur, it will be of the sort they have seen on a lighting sub-circuit. Further to this, there is too little actual instruction in artificial respiration.

During 1949, attention was given to electrical installations in gas works, and an approach was made to the Institute of Gas Engineers to suggest the setting up of an electrical sub-committee to consider points that emerge. Such a committee was set up, and the Electrical Branch is represented on it.

Portable Tools

Portable tools remain a matter of close concern to the inspectorate, but it was possible to report of 1949 that "there is a decided move by associated groups and many large factories towards the adoption of low voltages." In some cases, involving the largest users, voltages lower than the 110 V, centre-tap earthed, recommended have been successfully adopted. Where no change in voltage has been made, there was an increase in the number of applications of special systems of control to ensure that earthing remained effective.

In the many accidents reported in which portable electric tools were a factor, trouble tended to involve the connectors at either end. Breakages and cases where conductors pulled out of the terminals were particularly prominent. Amongst the accidents noted are again some emphasising the necessity of maintaining the earth wire in good condition. One branch of the portable tool problem is the building site. Here low voltage operation is the only satisfactory answer.

Attention was focused on circuit protection by the growing number of cases where fuse failures have occurred with sufficient violence to wreck the housing. This is illustrative of the growing difficulty of combining short-circuit, overload and earth leakage protection in one fuse, especially where time-grading is also required in the overload feature.

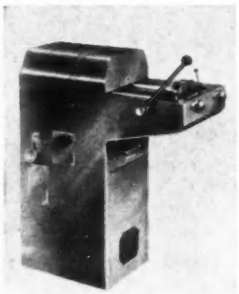
In addition to the general opinions briefly summarised here, Electrical Accidents contains many illustrative examples from the files of the electrical inspectorate, which make it valuable as well as interesting reading for all electricians, plant and installation engineers.

The BUYER'S *Column*

"Staffa" introduce ⅜" Screwing Machine

DESIGNED for the accurate high-speed threading of bolts, pipes and other components is the "Staffa" ⅜ in. single spindle screwing machine recently introduced by CHAMBERLAIN INDUSTRIES, LTD., Staffa Road, Leyton, E.10.

Pedestal is fabricated, comprising two mild steel side panels which form an integral part of the cutting, lubricant and swarf cradle, thus obviating any joins. The motor, lubricant reservoir and bearing housing are contained within the pedestal, the whole being firm and rigid, permitting precision screw thread cutting.



Staffa's ⅜ in. screwing machine

The hollow spindle for mounting a rotating diehead, runs in self-lubricating "Oilite" bearings. Directly under the mouth of the swarf cradle is a removably trough fitted with a fine mesh filter. Carriage assemble itself comprises a flat top table to which the work holding fixture is mounted, two tubular guide bars provide the slide bed. Movement of the assembly is controlled by simple lever arrangement.

To determine the length of the thread cut, two screwed shafts with trip adjusting nuts are housed in the tubular slide bars. A cross-head bracket positioned inside the machine's pedestal couples two ends of the screwed shafts together and from this the yoke of the die head is controlled. The two trip nuts are adjusted by control knobs marked with the lengths of table movement. The carriage registering against the trip nuts effects the automatic opening and closing of the die head.

Single V belt drive from a ¾ h.p. motor transmits the power drive to the spindle. The motor being controlled by a flush mounted direct on line starter.

Photoflux Range Extended

SIXTEEN different types of "Photoflux" flash bulbs are now available from PHILIPS ELECTRICAL LTD., Century House, Shaftesbury Avenue, London W.C.2.

The P.F.14, 25, 60 and 100 bulbs are for use with the between lens shutters whether for synchronised shutters or by "open flash." Types P.F.24 and 45 are long flash bulbs especially designed for use with focal plane shutters; with the exception of P.F.14 all are available for colour work. Blue coatings are used on lamps for daylight colour work, whilst yellow coatings are used on bulbs for artificial colour films.

List prices are P.F.14, 1s. 1d., P.F.25, 1s. 4d., P.F.60, 1s. 8d., P.F.100, 2s. 6d., P.F.24, 1s. 6d., P.F.45, 2s. Colour work bulbs are as follows:—P.F.25/97, 1s. 6d.; P.F.60/97, 1s. 10d.; P.F.100/97, 2s. 9d. (these are coated blue for "daylight" work). P.F.25/98, 1s. 6d.; P.F.60/98, 1s. 10d. and P.F.100/98, 2s. 9d. are coated yellow for artificial light colour work.

"Scruit" Together

A LEAFLET just issued by V. G. MANUFACTURING CO., LTD., Gorst Road, Harlesden, N.W.10, focuses the attention of this column on the "Scruit" porcelain connector. Simplicity in itself, the connector is just screwed on to the ends of the cables to be joined, where it effects a definite electrical and mechanical junction, besides being a perfect form of insulation.

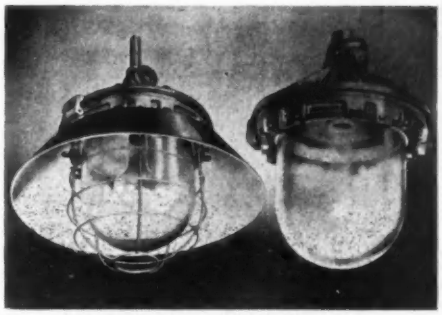
Complying with I.E.E. regulations the "Scruit" connectors are made in four sizes for 2-40/0076, 2-3/036, 2-7/036 and 2-7/044 cables.

Victor 300 W FLP Fitting

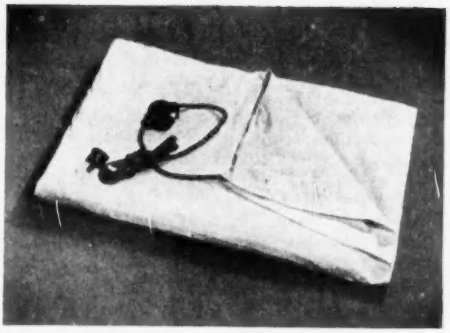
OF particular interest to the petroleum industry, coke and gas trades, and shipbuilding is this new flameproof lighting fitting designed by VICTOR PRODUCTS (WALLSEND), LTD., Wallsend-on-Tyne.

The design has three important features: the first is the inclusion of a practical making-up chamber incorporated in the direct top entry gland, secondly the top cover of the fitting is provided with a small cowl to prevent entry of water at the flange, and thirdly the bottom lamp glass cover has been hinged to simplify lamp replacement.

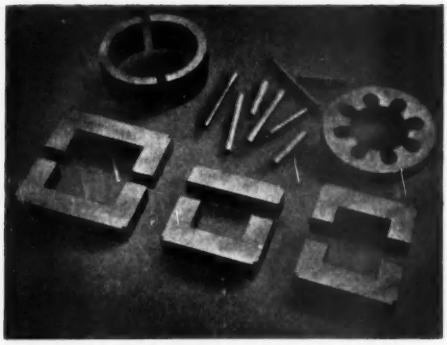
Wiring is by direct top entry or by side entry with a four-way junction box. The unit is fully Buxton certified for groups 1, 2 and 3.



This is the Victor 300W, FLP fitting



This is the electric blanket by Easipower



A selection of Ferroxcube cores for T.V. work

Easipower Electric Blankets

ELECTRIC blankets and heating pads have now been added to the range of products marketed by EASIPOWER LTD., 213 Gloucester Place, London N.W.1.

The heating pads are a production of a Continental firm of, we understand, great experience and are of such a high quality that Easipower feel confident in marketing them under their name.

The electric blanket measures 31 in. by 53 in. and is fitted with a three heat control switch. It enjoys thermostatic protection, has a low current consumption and is supplied with a washable linen cover. Price is £6 7s. 6d. plus £1 11s. 10d. purchase tax.

The thermostatically controlled heating pad measures 12 in. by 14½ in., it has the same control and protection arrangements, and like the blanket it does not cause radio interference and is fitted with a washable linen cover. Price is £2 7s. 6d. plus 11s. 10d. purchase tax.

Mullard "Ferroxcube" Core Material

FERROXCUBE, a new non-metallic, high permeability, and low-loss magnetic core material, introduced by MULLARD LTD., Century House, Shaftesbury Avenue, W.C.2, is today finding numerous important applications in the television industry. They include line output transformers, deflection coils, and linearity and picture width controls.

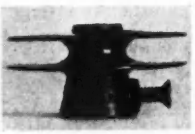
The use of Ferroxcube in these components leads to improved efficiency, marked reductions in size and an appreciable saving in steel.

Ferroxcube for the U cores in line output transformers has numerous advantages over cores of the laminated type. The efficiency of the material at frequencies above 10 kc/s is greatly superior. Moreover, Ferroxcube, being of solid form, provides a more compact and easily assembled component.

Ferroxcube core material in ring form, can be conveniently used as the magnetic circuits around the deflection coils in television receivers. In this application the Ferroxcube ring, having a very high permeability, provides excellent screening, thus reducing the possibility of leakage flux coupling with other components in the receiver. Ferroxcube core material may conveniently be extruded into rods and tubes.

An Insulator for Portable Fences

IN order to provide electric fencing equipment at a cheaper price NIELD'S PATENTS, LTD., Lower Cathedral Road, Cardiff, Glam., have recently introduced a new type of unbreakable insulator.



The rod type

Made from polythene the insulators can be used with a round rod post when they can be adjusted in height by rustless screw fitting to suit the type of animal in the enclosure. With pigs the height recommended is 18 in. and with cattle 2 ft 8 in. from the ground.

The 2 in. diameter shields on these insulators help to justify the name of "No-leak" insulators. A similar pattern of insulator is supplied for nail fixing to wooden posts. Price of the "No-leak" adjustable insulator for rod posts is 5d. each and for the nail-on type 4½d.

TRADE PUBLICATIONS

SOLDERS AND FLUXES.—Fry's Metal Foundries, Ltd., Tandem Works, Merton Abbey, London S.W.19, have recently reprinted a series of technical leaflets in booklet form when they had the opportunity of bringing the information up to date.

STREET LIGHTING.—Automatic Telephone and Electric Co., Ltd., Showger Works, Liverpool 7, have just published a new leaflet, No. 1140, dealing with an appropriate subject: "Street lighting for new communities."

ACCESSORIES.—Terminal line blocks simplifying the complications of joining different gauge and different type wires and cables, are described in a brochure by Standard Telephones and Cables, Ltd., Oakleigh Road, New Southgate, N.11.

THE WEEK

COMMERCE *in news* INDUSTRY

Copper Prices Reduced

IT has been announced by the Ministry of Materials that as from September 13 the price of electrolytic copper will be reduced by £7 to £227 per long ton delivered to consumers' works.

This reduction is attributed to the decision of the Ministry to buy copper at prices exceeding the American f.a.s. export price as quoted in the *Engineering and Mining Journal*.

Discounts, premiums on special shapes and the limitations on forward purchasing arrangements announced by the Ministry of Supply remain unchanged as does the Materials Ministry's buying price for rough copper in slabs of from 2 to 3 cwts.

An order making corresponding adjustments in the controlled maximum prices of scrap and unwrought brass from September 13 has been made by the Minister of Supply.

Power and the Census of Production

AS already announced by the Board of Trade the forms for the Census of Production 1951, which will be sent to firms during the first week of January, 1952, will contain questions relating to the power equipment and fuel usage of firms and their shift working arrangements.

Details of these subjects will normally be required for the week ending September 22, 1951, and will be required from all establishments employing more than 10 persons on the average, which come within the scope of the census of production, except those of textile converters, builders and contractors, and the building and civil engineering departments of local authorities, railway, tramway and canal undertakings. Special arrangements for coal mines, petroleum refineries, electricity and gas undertakings have been made in co-operation with the Ministry of Fuel and Power.

Firms are being asked to state the total installed capacity on September 22, 1951, and reserve or idle capacity during the week ending on that date of the following:—

(*a*) The various types of prime movers driving generators expressed in terms of brake horse-power for reciprocating internal combustion engines and horse-power in all other cases.

(*b*) The various types of prime movers not driving generators.

(*c*) generators expressed in terms of their rated maximum continuous capacity in kilowatts.

(*d*) Electric motors expressed in terms of max. continuous brake horse-power distinguished as far as possible between those driven by purchased electricity and those driven by electricity generated within the works, with separate particulars of the number and capacity of f.h.p. motors less than 1 h.p.

A Toy Iron—a Warning

DANGEROUS features in a toy electric iron now on sale in this country, have been publicised by the Royal Society for the Prevention of Accidents. This toy has no heating element, but is provided with a length of imitation flex and a metal two-pin plug which will fit electric sockets. If a child probed a live socket with it, the consequences might be very serious, it is stated. The attention of the Home Office and the Board of Trade has been drawn to the matter.

Register of Industrial Premises

THE Government has created an organisation within the Board of Trade which will be responsible for the establishment of a control of factory and storage premises in the event of an emergency. Its name is the Factory and Storage Premises (Defence Planning) Division.

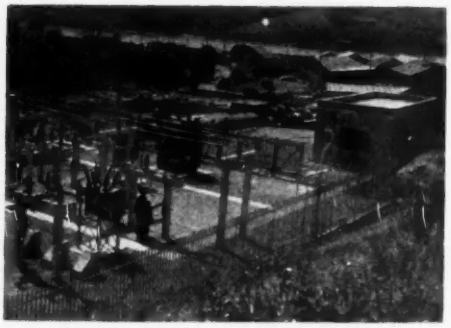
Industrialists throughout the country will shortly receive a questionnaire concerning their premises. The approach will only be made to firms occupying a floor space exceeding 5,000 sq ft and will exclude those already committed to the rearmament programme. Information collected will be regarded as strictly confidential.

Housewives' Part in Load Spreading

A PLEA to housewives to re-plan their household meals whenever possible and to do some of their work during the evenings to help the "save electricity" campaign is to be made by the Midlands Electricity Peak Economy Committee.

The First Half-Century

With that caution which is characteristic of our nation we have waited for the perfection of electric tramways before laying down any such system ourselves. Having at last come to the conclusion that the system really is good, and that profit is almost certain to accrue by its use, we are now about to lay down electric tramways broadcast. But in exercising this caution we have waited so long as to be almost in sight of the time when motor cars may compete with tramways and cause the capital which is sunk in them to be of little or no value.—*From our issue of September* 19, 1901.



This new substation will serve the Bideford area

At a conference recently, Ald. J. Lewis, chairman of the Midland Electricity Board, said industry was already playing its full part in load spreading. The key to the problem of economy, it was emphasised, was the electric fire, of which there were approximately 1,250,000 in the area. It was suggested that offices might be cleaned in the evening instead of the morning; that people should bath at night instead of the morning; and that other tasks in which electricity was used should be postponed to off-peak hours. Economy could be achieved, it was felt, without recourse to such drastic methods as cuts.

Bideford's new substation

FOLLOWING the extension of the 132 kV grid from Taunton to East Yelland, the South Western Electricity Board has constructed a major switching station at Bideford. This is part of a scheme to improve the h.v. network in North and West Devon by accepting 33 kV supplies from the power station being built at East Yelland, which should begin feeding power into the Grid in 1952. The Bideford switching station will enable the existing 33 kV system to be greatly extended, reinforcing the 11 kV network on which demand is steadily increasing.

"Show Day" at B.T.H., Willesden

WEATHER which would have rendered "Show Boat" more suitable failed to spoil the annual show day at B.T.H., Willesden Works, on Saturday. Held in aid of the Xmas Party Fund, this event included displays by the works fire brigade and St. John Ambulance team, in addition to a show by the horticultural society and an exhibition of handicrafts and hobbies ranging from model locomotives to stamp collections. Prizes were presented by Mr. P. E. Gaze (manager, Switchgear Sales) who, with Mr. H. E. Cox (manager, B.T.H. Willesden), later conducted a grand auction in aid of the fund.

Radio Show Goes North

NORTH country interest in this year's Radio Show was so evident that the organisers have decided to hold a radio and television show in the City Hall at Manchester in the spring. Provisional dates are April 23 to May 3.

The B.B.C. has assured the Radio Industry Council of its co-operation.

Mr. F. W. Perks, chairman of the organising committee, said that the committee were satisfied with the attendance of 232,752 in their first year at Earls Court and they intended to return in 1952. Trade attendance was satisfactory whilst the overseas attendance of 1,818 was a record. Export business was good and the industry was now exporting £24 million worth of goods per year as compared with £18 million in 1950.

Rise in Radio Sales

SALES of radio sets in July were higher than in June, according to the latest statistics issued by the Radio and Television Retailers' Association.

In television sales, however, there was a slight decrease: the sales index figures being as under.

	Radio	TV
June, 1950	8·11	3·88
1951	6.31	3·32
July, 1950	9·07	4·51
1951	7·24	3·07

This index figure is the average number of sets sold per shop.

Ekco Lamp Publicity

ATTRACTIVE forceful showcards are being issued to suppliers of Ekco lamps and lighting equipment by Ekco-Ensign Electric Ltd. in connection with the lamp sales campaign for the coming season. The showcard illustrated is 14 in. high and is a three-dimensional cut-out in full colour. One of the range already prepared, the card, is constructed from heavy board and is efficiently strutted to stand firmly in window or on counter.

An example of Ekco material

Graduates and Engineers Meet

A THREE-DAY convention was recently organised by the Southern Electricity Board under their training obligations as laid down in the 1947 Act for graduates and engineers. The convention included addresses on accident prevention, system planning, lighting effects, transformer design, h.v. transmission, water heating and legal aspects of the Board's work by senior officers of the B.E.A. and the Board and by outside speakers who included Dr. R. H. Golde of E.R.A., E. T. Norris of Ferranti and H. E. Roff, director of the Institute of Personnel Management.

Ediswan acquire two Firms

AN announcement has been made by the Edison Swan Electric Co., Ltd. to the effect that the whole of the issued share-capital of British

B.I. Callender's home of rest at Lytham, Lancs.

Mechanical Productions and the General Accessories Co. have been acquired by them.

The new boards will be: Mr. H. Butterworth, chairman and managing director; Captain C. R. Cook, and Messrs. S. Barber, J. W. Ridgeway and E. T. Robinson.

B.I.C.C. Employees' Home of Rest

A NEW extension to the Employees' home of rest at Lytham (Lancs) was recently formally opened by Alderman R. J. Hall, J.P., a director of British Insulated Callender's Cables Ltd.

Just prior to World War II the Lytham home was purchased; the continual growth of the company's scheme necessitated larger premises and fortunately it was possible to purchase a suitable house adjoining the existing home. Accommodation is now available for 44 guests.

To mark the opening the directors of B.I.C.C. presented a radiogram which has been installed in the lounge of the new home.

Tide Level Quayside at Holyhead

AFTER the introduction of the two new motor vessels *Cambria* and *Hibernia* on the Irish Mail route between Holyhead and Dun Laoghaire, British Railways (L.M.R.) installed two electrically operated adjustable platforms at Holyhead to speed up the disembarkation of passengers. They also obviate the need for passengers to negotiate the gangway at a severe angle.

Adjustable over a height range of 6 ft 9 in. these platforms provide a level gangway at any tide. Each platform has a timber deck 10 ft square which projects 4 ft beyond the customs building and 12 independent steps are provided to give access from the platform to the upper floor. As the platform is moved these steps are picked up in succession by underframe and are arranged to form a level surface continuous with the deck. They are held in position by guides which run in small vertical channels recessed in the stair walls.

An arrangement of bevel gears and shafts powered by a 5 h.p. electric motor operates the movement of the deck. An electro mechanical brake being fitted to ensure that the driving gear is stopped and the platform held level with a step. Overrun is prevented by limit switches, the mechanism being worked by push-button starter.

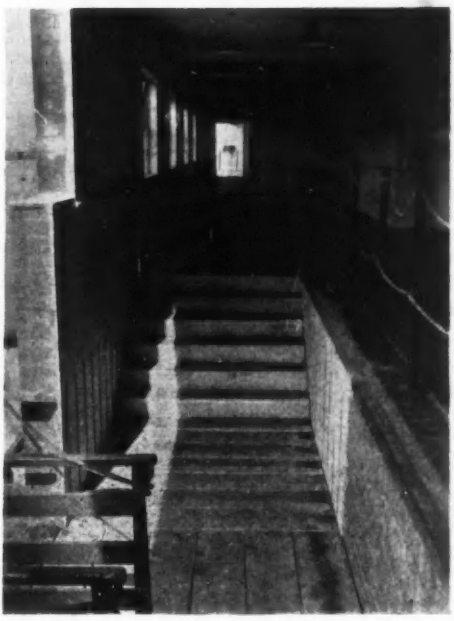
Ekco's Silver Jubilee

TOMORROW, September 21, is the 25th anniversary of the founding of the firm of E. K. Cole, Ltd., of Southend-on-Sea. To mark the occasion some 6,500 employees and friends, from the firm's factories and depots will occupy the entire Harringay arena to enjoy the show *Rose Marie on Ice*. Six special trains will bring 5,200 from head office and works at Southend, and from Malmesbury 30 coaches have been chartered. Every guest will be provided with a supper-box and a special souvenir programme. During the evening Mr. E. K. Cole, the firm's chairman and founder, will present gold watches to four employees who have served throughout the 25 years, while Mr. Cole himself will be presented with his portrait painted by Frank O. Salisbury, C.V.O., for which the company's employees have subscribed. Mrs. E. K. Cole will also receive a souvenir of the occasion.

Canadian Graduates Arrive

THE first Canadian engineering graduates to receive awards under the new Athlone Fellowship scheme arrived in this country last Friday. Altogether 38 Athlone Fellowships will be awarded each year by H.M. Government to enable Canadian engineering graduates to take post-graduate training in the United Kingdom. Among those who have just arrived, three are

This view gives an adequate picture of the electrically operated gangway at Holyhead



going to Met.-Vickers, two to the B.T.H. Co., one to the English Electric Co., and another to Evershed and Vignoles.

"Flying Dutchman"

THE idea that retail agents should see the production of their products they handle is a well-established one in the electrical industry, but its application last week showed considerable originality, not to say boldness in conception, when 55 Thor dealers from the Netherlands were flown over to inspect the manufacture of Thor and Parnall products in Gloucestershire, and returned to Holland the same day.

Arriving by two K.L.M. Dakotas at Weston-super-Mare (after touching down at London Airport for Customs formalities), the party proceeded to Bristol for lunch, then to the factory of Parnall (Yate) Ltd., who manufacture both types of Thor washers in this country. During their stay, the party had an opportunity of seeing the production methods employed, and seemed particularly impressed with the rigid inspection system for the mechanism components. The language problem was solved by the assistance of the two K.L.M. air hostesses, who took part in the tour and acted as interpreters.

E.I.B.A. Golf Championship

WINNER of the medal competition in the East Midlands Area Final of the E.I.B.A. National Golf Championship, is Mr. C. S. Littlewood, with a net score of 68 (gross score 90, handicap 22). Runner-up was Mr. S. K. Fletcher, net score 71 (gross score 89, handicap 18), while Mr. R. B. White returned the best scratch score, net 72 (gross 80, handicap 8). These names are submitted for the national finals, to be held next week at the Notts Golf Club, Hollinwell; in addition to the main event, a nine-hole four-ball bogey competition was introduced, the winners being Messrs. T. N. Robertson, M.I.E.E., M.Inst.F., and J. B. C. Miller-Bakewell. The joint runners up were Messrs. H. Cantrell and I. A. Macdonald. Both competitions were well supported by members of the industry, with the result that a sum of £150 was raised for the Benevolent Association.

Worcester Electric Club

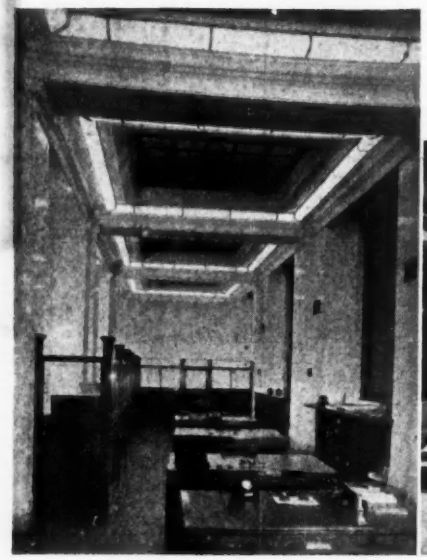
A PROGRAMME card for the 1951-52 season has been sent to this paper by the Worcester Electric Club.

This club has been functioning for five years and membership now totals 120. The club is open to all who earn their living in electrical industry and to others who have electrical qualifications.

First meeting is on Thursday, September 20, and others follow at four-weekly intervals. They are usually held at the Talbot Hotel, Tything, at 7.15 p.m. and we understand visiting members from other societies would be made to feel most welcome. Secretary is W. A. Foyster, 11 Cavendish Street, Worcester.

Questions from the Road

LAST Friday we were invited to the Feathers Hotel in Broadway, Westminster, where seventy members of the Electrical Trades Commercial Travellers Association met for a Questions Forum. In the chair was H. A. Deacon of Cryselco. His team was Colin Brooks, Editor of *Truth* and well known to T.V. viewers, Cdr. Eric Marshall, Kenneth Lewis and Michael Romain. We think we now know where the gentlemen "on the road" replenish their stock of jokes.



Left, a G.E.C. cold cathode lighting installation in the Edinburgh head office of the National Bank of Scotland. Average illumination is 28 lumens per sq ft. Below, a B.T.H. Mazda installation in the drawing offices of the Wolverhampton Corrugated Iron Co.

A Clean Up

LIVERPOOL CORPORATION has recently installed 14 electric washing machines at their Clare Street public washhouse, at a cost of £3,650. Cost of operation will be £754 a year, but the extra income will be over £1,800 annually it is estimated. When he recently inspected the installation, Alderman A. E. Shennan, leader of the City Council, said that a delegation of baths' superintendents visiting Liverpool had paid tribute to the city's lead in providing modern amenities for public washing of clothes.

E.D.A. Public Speaking Competition

DETAILS of the 1952 E.D.A. Public Speaking Competition has just been released. There will, as usual, be separate sections for men and women, with area finals as part of the scheme of things. Competitors may choose their subjects from: "Was the Festival of Britain Justified?"; "What I Mean by Freedom of Choice," and "Should Housing Estates be All-Electric?" Members of the staff of Electricity Boards, the North of Scotland H.E. Board and E.D.A. members in Northern Ireland, who will be under 35 years of age on March 31 next, are eligible. There is a prize of £5 (for men) and £3 (for women) in each of the area competitions, and certificates are also given. The first prize-winners will represent their areas in the national finals. Details of the competition can be obtained from E.D.A., 2 Savoy Hill, W.C.2.

A Halt in Rural Electrification

RURAL electrification schemes in the south western area are to be shelved for the time being. That is the effect of a statement made at the area Electricity Consultative Council meeting last Friday when, it was stated, that the capital allocation to all the Area Boards for 1952-53 had been reduced by £4,250,000. The council approved a resolution viewing with great concern the proposed Government restrictions on rural development, which emphasise that predominantly industrial areas will rank for first consideration. Whilst agreeing with the importance of industrial requirements, the council strongly protests to the Minister of Fuel and Power against the assumption that food production at the present time and in the foreseeable future is not a strategic priority. The council considers that agriculture should rank equally with other sections of essential industry for the allocation of capital for new supplies of electricity.

At the meeting, the Board reported that under the 1951-52 rural development programme, based on the capital allocation applied for, it was expected to connect a further 1,220 farms and 8,800 rural premises in that year.

A Met-Vick installation north of the border—S.O. 50 lanterns in the Burgh of Kilsyth

S.W. Board Feels Increase in Demand

IN a report to the consultative council made by the Chief Engineer of the South Western Electricity Board, Mr. G. O. McLean, M.Eng., A.M.I.E.E., it is stated that the number of units sent out had increased by 204 million or 14.6% of the previous year.

To meet this additional demand and to give supplies for the first time to over 25,000 new consumers about £3 million additional capital was required, 148 miles of underground cable were laid, 396 miles of o.h. lines erected and 500 extra transformers connected to the system.

Standardisation of design equipment and methods and quantity buying had saved £80,000 per year in the building of 33 kV and 11 kV overhead lines. This and other measures were resulting in a saving of 10% of the Board's annual capital expenditure. Whilst the use of aluminium conductors for low-voltage mains including house services would eventually result in a 30% saving for this type of work.

Electricity Regulations

An explanatory memorandum clarifying the Electricity Regulations as laid down in the Factories Acts, 1937 and 1948, has been issued by H.M.S.O., price 3s. This will be reviewed at some length in our next issue.

NEWS IN BRIEF

Every Wednesday in October, from 5.30 p.m. to 6.30 p.m., the Electrical Association for Women will welcome anyone who wishes to receive a few hints on electrical matters, such as reading a meter or mending a fuse.

The E.P.E.A. Southern Meter Engineers Technical Group are commencing their season's programme of lectures and discussion on Thursday, October 4, when Dr. J. S. Forrest will give a lecture on "Measurement of Insulation."

Electric Supply News

Bromborough

Every effort is being made to get the new power station at Bromborough working as soon as possible and it may go into full operation within two months, Mr. A. R. Cooper, controller of the Merseyside and North Wales Division of the B.E.A. declared a few days ago.

Bracknell

The expansion of the Bracknell new town area by the Bracknell Development Corporation will mean an ever increasing demand for electricity. To meet this demand the Southern Electricity Board are to construct a new main substation at Finchampstead Road, Bracknell, at a cost of about £70,000. Work on the new station, which will be unattended, is to begin in the near future and it is hoped the large scale scheme will be completed by the winter of 1952-53. Until now the Bracknell district has been supplied from four points at Maidenhead, Sunninghill, Farley Hall and Littlewick. The proposed substation will be the fifth point of supply and will be ceded into a common 6·6 kV network.

Douglas (I.O.M.)

The Electricity Committee has approved a recommendation by the borough electrical engineer that in order to encourage the use of electricity during the night a cheap rate of ¾d. should be introduced for water heating between 11 p.m. and 8 a.m. The Committee has also approved the introduction of a rate of 3d. p.u. for shop window lighting after 6 p.m. from October to March.

Durham

The County Education Committee has protested to the North Eastern Electricity Board against the "apparently high service charges" notified to the Committee in respect of certain projects for installing electricity in schools.

Easington (Co. Durham)

The Rural District Council has had an interview with representatives of the North Eastern Electricity Board regarding the renewal of service cables at houses at Blackhall and Shotton. At present electricity to these houses is supplied by the National Coal Board. It was stated that the supply loops between the houses were in some areas in an unreliable and dangerous state and in other cases the cables were not big enough to carry the load. It was urged that the Electricity Board should take over the supply from the N.C.B. but the Electricity Board's representative pointed out that negotiations with the Coal Board to take over the electricity supply in the area generally were almost at a standstill. The only hope seemed for pressure to be brought on the Coal Board to make a move in the matter. The Council agreed to ask the Coal Board to grant an interview. Miners' lodges and parish councils in the area are to be asked to co-operate in supporting the Council's representations on the matter.

Hertfordshire

To relieve some of the overload at present placed on the existing main cables serving St. Albans, Welwyn, Hatfield and Elstree, new main cables operating at 33 kV are being installed.

This is the first work on mains supply in the area since 1936 and it is hoped that the first stage of the project, carrying the supply into a new substation in Cell Barnes Lane, St. Albans, will be completed in time for the winter. From this substation cables operating at 11 kV will be laid to parts of St. Albans and the rural district.

Northumberland

A meeting of Northumberland landowners at Chollerford has decided "in general" to support the alternative line suggested by the Council for the Preservation of Rural England in its opposition of the British Electricity Authority's proposed overhead grid line between Blaydon and Carlisle.

Sheffield

During the year ended March 31 last electric street lamps in use in Sheffield increased by 722 to a total of 15,259, and the number of gas lamps was reduced to 12,238, Mr. C. J. Chisholm, the city lighting engineer, records in his report. In addition to lighting of new housing estates, this includes 233 conversions from gas, and the Corporation have a number of new schemes in hand. Electricity consumption in the period increased by 330,401 units to 6,646,451. Malicious damage is still extensive, a total of 960 electric lamps having been broken and 87 stolen, in addition to the 5,504 panes of glass in gas lamps being broken. On load shedding, the Lighting Department, with the Yorkshire Electricity Board, were unable to find a solution for the isolation of street lighting from power cuts, we note in this very informative report.

Yorkshire

The Central Authority has rejected representations by the area Consultative Council against the Yorkshire Electricity Board's proposed new standard domestic tariff. The Council had estimated that 575,000 would be called upon to pay more under the proposed tariff, but the Central Authority has said they could not direct the Board to ease the effects of the new tariffs by using the area financial reserves. But at the Consultative Council meeting last week, Mr. F. Newey, deputy chairman of the Board, announced that it had been decided not to put the new standard tariff into operation before April next, in order that the Board would have time to consider carefully the probability that charges would have to be increased because of the rising costs. He pointed out that the Board was already bearing £200,000 a year in extra costs resulting from the last rise in coal prices. Then there had been a wage increase which would cost an extra £130,000

a year, other applications for wage increases, and a rocketing of prices of materials.

It was also reported that the Board has received a further allocation of capital so that the work of installing electricity would be carried out in more mining villages.

LIGHTING SCHEMES

Brigg.—The Yorkshire Electricity Board has withdrawn quotations for three new street lighting schemes for the Council, owing to restriction on capital expenditure.

Glasgow.—The Police Committee has recommended the changeover of all street lamps from gas to electricity, spread over ten years, at an estimated cost of £240,000.

Newry.—The U.D.C. has asked the Northern Ireland Electricity Board to erect sample lamps sent in by five English firms tendering for contracts in connection with the Council's new lighting scheme. The scheme, which is to commence in November, is estimated to cost £28,875, and when completed 450 fluorescent lamps will replace the existing 300 gas lamps.

Company Activities

Hilger & Watts

To provide additional finance required to complete the erection of the pilot factory at Debden, made necessary by the increased cost of materials, consent of the C.I.C. has been obtained and the requisite resolution passed to issue a further 100,000 debenture stock. This has been offered to existing debenture holders at par, in the proportion of £50 of new for every £100 held.

James Howden & Co.

For the year to April 30 last, profit before taxation, but after interest, depreciation, etc., increased by £255,243 to £579,477 (*£324,234*). The directors recommend a final dividend on the £546,000 Ordinary stock of 10%, requiring £28,665 net. This is the maximum allowed under the White Paper's dividend limitation proposals. It is also proposed to transfer to dividend reserve £21,138, representing 5% on the ordinary (net £14,332), also the amount required to meet the estimated net distribution thereon. Taxation provision amounts to £322,019 (*£175,447*). To general reserve £161,585 (*£40,000*) pension fund, £30,000 (*nil*), leaving £48,259 (*£46,522*) carried forward. In the previous year £40,000 was written off goodwill and £20,000 off patents.

Kelvin & Hughes

Consolidated profit for the year to March 31 was £129,248, compared with £149,219 for the previous 53-week period. This sum is after allowing £45,259 (*£39,176*) for depreciation, etc. Taxation takes £94,965 (*£105,120*) leaving a net profit of £34,283 (*£44,099*), plus £23,451 (*£1,955*) provisions no longer required. Subsidiary's losses £33,789 (*profit £19,068*). The parent company's net profit is £91,523 (*£26,986*). To pensions £10,000 (*nil*), and after the ordinary dividend of 7½% (*same*) there is £84,254 (*£15,915*) carried forward.

Lancashire Dynamo Holdings

The directors announce that as the accounts will not be completed by the first week in April, 1952 and the final dividend will be paid later than is customary, it has been decided to pay an interim of 4%, less tax, on the Ordinary including the new bonus stock. In the present circumstances, the directors add, it is anticipated that the interim together with the final will not exceed the total dividends paid for the previous year.

Madras Electric Tramways (1904)

The directors are deferring the dividend for the half year to June 30 on the 6% Cumulative Preference until results for 1951 are available. No distribution has been made on the Ordinary stock since the 10% for 1947.

Skefko Ball Bearing Co.

Consent of the Treasury has been obtained to a rights offer of 400,000 Ordinary shares of 5s. each, on the basis of one for every eight stock units held. The issue is to be made in the near future.

Strand Electric Holdings

Net consolidated profit for the year to April 30 last, after taxation, was £21,912 (*£25,146*), according to the preliminary statement. The dividend is again 17½%.

Wellman Smith Owen Engrg. Corp.

It is proposed to capitalise £290,536 from general reserve and the excess profits tax post-war refund balance of £9,464 for a scrip bonus distribution of 300,000 £1 Ordinary shares on the basis of one new share for each share held on September 17. The new shares will rank for dividend from April 1, 1951, but under the White Paper proposals, the maximum admissable dividend on the increased capital will be 10.79%.

Dividends Declared

Associated Electrical Industries Ltd.—An interim ordinary dividend of 7½%, less tax, payable on October 17, is announced. The object in paying an interim dividend of 7½% compared with 5% in 1950, is no other than to divide the total dividend payment between interim and final in more suitable proportions, the directors state.

A. H. Hunt Ltd.—Interim of 7½% (*same*) payable on October 20.

A. Reyrolle and Co.—Interim of 7½% (*same*) payable on September 29.

Watford Electric and Manufacturing Co.—Interim of 5% (*same*), but the new Ordinary, issued last June, is entitled to half of any dividend paid for the year 1951.

Commercial Information

CONTRACTS OPEN

HOME

Sept. 21.—Hull T.C. Electrical installation in St. George's Rd. School. City architect, Guildhall. Deposit £1 1s.

Sept. 22.—Blackpool T.C. Supply of 350 concrete columns, lanterns, chokes and capacitors for Group A street lighting; 100 same for Group B, and 500 synchronous time switches with solar dials. Public Street lighting Officer. Electrical Services Dept., Rigby Rd. East. (See Aug. 23 issue.)

Sept. 22.—Cuckfield R.D.C. Revision and overhaul of electrical installation in Council Offices at Boltro Rd., Haywards Heath. Cables in poor condition to be replaced; new points to be installed, and certain others moved, etc. A. Bradley, clerk of the Council, Rural Council Offices, Boltro Rd., Haywards Heath.

Sept. 22.—Fife. Electrical work in sub-divisional police station at Burntisland. Surveyors, Robt. Galbraith and Lawson, 21 Crossgate, Cupar.

Sept. 22.—Inverness. Electrical work in construction of blood transfusion unit, for Northern Regional Hospital Board. Regional Board architect, Raigmore Hospital, Inverness.

Sept. 22.—Stretford T.C. Electrical installations in 24 flats at Christie Rd. site (west section). A. H. Perry, borough surveyor, Town Hall, Stretford. Deposit £2 2s.

Sept. 24.—Ashby-de-la-Zouch U.D.C. 81 Class "A" street lamps, comprising 79 25-ft. concrete columns and 2 25-ft. steel columns, 49 sodium and 32 fluorescent lamps with equipment. Surveyor, Town Hall, Market Street, Ashby-de-la-Zouch. Deposit £2.

Sept. 24.—Castle Ward R.D.C. (Northumberland). Electrical installation in 24 houses at Ponteland. Plans by G. E. Dimmack, surveyor, North Road, Ponteland. Deposit £2 2s.

Sept. 25.—Bentley-with-Arksly U.D.C. Electrical installation in 40 houses at Scawthorpe. Surveyor, Council offices, Cooke Street, Bentley, near Doncaster. Deposit £2 2s.

Sept. 25.—Romford T.C. Provision and erection of 53 Class B street lighting columns (concrete) and lanterns at Gobions Housing Estate. Borough engineer and surveyor, Town Hall, Romford. Deposit £2 2s.

Sept. 26.—Gosforth (Northumberland) U.D.C. Installation of electricity in 18 flats in Graham Park Rd. Surveyor is Clifford Wyld.

Sept. 26.—Hull. Electrical installation in hostel for aged persons, Anlaby Road Redevelopment Area (St. Luke's Street). City Architect's Department, Guildhall, Hull. Deposit £1 1s.

Sept. 27.—Torquay T.C. Electrical installations in 29 houses and 14 Old People's dwellings on the Marldon Road estate. Borough surveyor, Town Hall, Torquay. Deposit £2 2s.

Sept. 27.—Kerry. Electrical installation, including lighting, occasional space heating and water heating in the Caperciveen District Hospital for county council. E. R. Ryan, Consulting Engineer, 1 Montpellier Terrace, Galway. Deposit £10 10s.

Sept. 27.—Watford T.C. (*a*) Supply of lanterns with fluorescent lighting fittings and control gear, and (*b*) supply and erection of precast concrete lamp columns for lighting of High Street (section 3). F. C. Sage, Borough Engineer and Surveyor, Town Hall, Watford.

Sept. 28.—Durham C.C. Electrical installation in five pairs of police houses at Duckpool Lane, Whickham. Plans by County Architect, Court Lane, Durham.

Sept. 28.—Heywood T.C. Supply of 40 steel standards with 15-ft. bracket arms, and suitable equipment for the installation of 140 W sodium class A lighting. Lighting Superintendent, Market Hall, Hind Hill St., Heywood.

Sept. 29.—Belfast R.D.C. Electric wiring work in connection with housing schemes at Whitehouse (34 houses) and Whiteabbey (8 houses). W. H. Jones-Clerk of the Council, Council Office, 51 Lisburn Road, Belfast.

Sept. 29.—Bristol. Supply and installation of sewage pumping plant which includes electric motor, switchgear, etc. J. B. Bennett, City Engineer, Arno's Court, 470 Bath Rd., Brislington, Bristol 4.

Oct. 1.—Acton. Installation of street lighting in Western Ave. Borough Engineer, Town Hall, Acton, W.3.

Oct. 1.—Bradford. Supply and erection of 4 automatically controlled, electrically driven pumping units, two with capacity of 1,400 g.p.m. and two 4,200 g.p.m. Sewage Works Engineer and Manager, Esholt Hall, nr. Shipley. Deposit £2 2s.

Oct. 1.—Limavady R.D.C. Electrical installations in houses and bungalows in course of erection at Ballyquin and Largy sites. Particulars from W. and M. Gwen, Architects and Civil Engineers, 1 Waterside, Coleraine, or A. Mitchell, clerk, Council Office, Limavady.

Oct. 1.—Newcastle-upon-Tyne T.C. Electric lighting and power installation at Blakelaw Girls Secondary School, for Education Committee. City Architect (Education Section), 18 Cloth Market, Newcastle-upon-Tyne. Deposit £2 2s.

Oct. 1.—Stockport T.C. Electrical installation in 60 houses on the Houldsworth Estate, Reddish. W. F. Gardner, Borough Surveyor, Town Hall, Stockport. Applications to be made by Sept. 21.

Oct. 2.—Leyton T.C. Provision, wiring and fixing of lighting in public hall, Town Hall. Further details and documents from Borough Engineer and Surveyor, Town Hall, E.10. (See Sept. 6 issue.)

Oct. 3.—Chichester. Supply and erection of five automatically controlled electrically driven pumping units and auxiliaries. Water Engineers' Office, Greyfriars, North St. Deposit £2 2s.

Oct. 3.—Downpatrick T.C. Supply and installation of 9 direct-driven centrifugal, electrically propelled pumps for town's sewage scheme. M. J. Hayes,

Town Clerk, U.D.C. Offices. Deposit £5 5s.

Oct. 5.—Liverpool T.C. Rewiring the electrical installation of St. John's Market. City Engineer and Surveyor, Municipal Buildings, Dale Street, Liverpool.

Oct. 8.—Belfast T.C. Supply and installation of electric heaters at Mountcollyer St. and Ariel St. maternity and child health centres, Belfast. City Surveyor's Department (Room 85), City Hall, Belfast.

Oct. 8.—Houghton-le-Spring U.D.C. (Durham). Supply and erection of reinforced concrete lighting columns and fittings in connection with replacement of gas with electric lighting on part of road A.182. Plans by W. H. Smith, Surveyor.

Oct. 8.—Northallerton R.D.C. Pumping plant. (*a*) Osmotherley; two electric motor and pumping sets each of 4,500 gal./hr.; (*b*) Jeater Houses: two sets each of 3,000 gal./hr., all with automatic control gear. Consulting Engineer, A. Brooksbank, 14 The Exchange, Bradford. Deposit £2 2s.

Oct. 15.—Darlington R.D.C. Two electric motor and centrifugal pumping sets, one of 4,500 gal./hr. and one of 12,000 gal./hr. Apply to Consulting Engineer, A. Brooksbank, 14 The Exchange, Bradford. Deposit £2 2s.

Oct. 31.—Brighton T.C. Dismantling the existing passenger lift, and installing a new one at the Town Hall. Borough Engineer and Surveyor, 26-30 King's Road, Brighton.

Date not stated.—North of Scotland H.E. Board. Supply, delivery and erection of 11 kV and lower voltage wood pole lines in the north east of Aberdeenshire, Strichen area. Work divided into three contracts. Apply to Merz and McLellan, Consulting Engineers, 39 Northumberland Street, Edinburgh 3. Deposit £1 1s. for each contract. Advertised this issue.

Date not stated.—Oswaldtwistle U.D.C. Installation and erection of 50 400 W and 25 135 W h.p. m.v. columns and brackets for 1951-52 lighting scheme. T. D. Manning, engineer and surveyor, Town Hall, Oswaldtwistle. See this issue.

Date not stated.—Rothesay. Installation of electricity in block of four houses for Scottish Veterans Garden City Assoc. J. H. Chilcott, gen. sec. of Assoc. Manor Place, Edinburgh.

OVERSEAS

*Details of items marked * may be obtained on application to Room 1076, Board of Trade, Thames House, North Millbank, S.W.1, quoting reference.*

Sept. 27.—Portuguese East Africa. One motor generator for Permanent Purchasing Commission, Treasury Dept., Lourenco Marques. B.o.T. (Ref. CRE IB) 7014/51)*.

Sept. 28.—Uruguay. Supply of various types of radio transmission valves, for Servicio Oficial de Difusion Radio Electr ca. B.o.T. (Ref. CRE (IB) 70102/51)*.

Oct. 4.—Australia. Coil winding wire: enamel covered 47 s.w.g.-20 s.w.g.; Eureka double silk covered 44 s.w.g.-27 s.w.g.; copper wire, enamel, single silk covered 37 s.w.g.-25 s.w.g., all varying quantities. B.o.T.*

Oct. 5.—Southern Rhodesia Gvt. Various lengths of phosphor bronze (cored and solid types). B.o.T. (Ref. CRE (IB) 70637/51).*

Oct. 17.—India. (a) Two 125 ton single trolley motor operated overhead travelling cranes with lighting beams, with an auxiliary hoist of 25 tons each, and (b) erection, etc., for the Director-General of Industries and Supplies, Shahjahan Road, New Delhi. B.o.T. (Ref. CRE (IB) 70418/51).*

October 25.—Sydney C.C. A set of three s.ph. aircore concrete embedded reactors, for 33 kV, and twelve cable sealing ends of the porcelain shrouded type, for Bu erong power station. B.o.T. (Ref. CRE (IB) 70265/51)*.

Nov. 6.—Egypt. Supply and erection of Cairo 63 kV underground cable system and associated transformer and switching stations for Cairo Electricity and Gas Administration. Documents available from Chief Inspecting Engineer, Egyptian Gvt., 41 Tothill St., S.W.1. Deposit £10 5s. (plus same for album of drawings). Ref. No. 30/Elec. and Gas. 3-2-208. (See Sept. 6 issue.)

Nov. 12.—Uruguay. Supply of some 134,300 metres covered h.t. cables between 15,000 V and 220 V with accessories, jointing boxes, terminal boxes, etc. Usinas Electricas y los Telefonos del Estado, Julio Herrera y Obes, Montevideo. B.o.T. (Ref. CRE (IB) 69233/51).*

Nov. 21.—Queensland. A number of small 22 kV distribution transformers, to Australian standard specification No. C 61-1946, for State Electricity Commission (for use by Cairns Regional Electricity Board). B.o.T. (Ref. CRE (IB) 70313/51)*.

Feb. 5 1952.—New Zealand. One 10,000 kVA 11 kV synchronous condenser for Invercargill substation for State Hydro-Electric Department. B.o.T. (Ref. CRE (IB) 70094/51)*.

Your Queries — Answered

"Noseparka" vacuum cleaners, makers of? E.D.—S.E.P., Ltd., 4 Eden St., Kingston. (21459)

"Haffenden" plugs, makers of? T.E.—W. W. Haffenden, Ltd., Richborough Rubber Works, Sandwich. (21465)

McGraw Electric Co., Chicago, agents for? E.E.—Frank V. Magrini, Ltd., 24 Royal College, St., N.W.1. (21472)

"Spraymaster" paint sprayers, makers of? W.I.—Bylock Electric, Ltd., 109 South St., Ponders End, Enfield, Middx. (21478)

"Clem" irons, makers of? L.E.—A.B. Metal Products, Ltd., 16 Berkeley St., W.1. (21483)

"Cornercroft" lampholders, makers of? E.B.—Cornercroft Ltd., Ace Works, Queen Victoria Rd., Coventry. (21489)

"Invicta" sewing machine motors, makers of? R.N.—Cray Electrical Motors, Ltd., 20/22 Cursitor St., E.C.4. (21495)

"Alder" washing machines, makers of? E.M.—Alder Electrical Appliances, Ltd., Rushworth St., Burnley. (21502)

The above are selected from questions we have answered this week. If you have a query, send it to us.

CONTRACTS PLACED

Durham C.C. Alterations and additions to electrical installations at Langley Park Modern School, R. Robson, £3,919; following the withdrawal of the previous contractor it had been decided to accept the estimate of Morris and Smiles at £1,913 for the electrical installation at Jarrow Croft Terrace Modern School.

Glasgow T.C. Development of Pinkston power station (stage 2) cooling tower, M'Kean and Co. (Glasgow) Ltd., £228,989.

Leicester. Electrical installation at Leicester Royal Infirmary, for Sheffield Regional Hospital Board, T. H. Wathes and Co. Ltd., £1,389.

Newcastle-upon-Tyne. Replacement of gas lighting with electricity in 67 houses on the Pendower estate, Dougal and Railton, £1,357.

Northampton. Installation of a bed-lift at the Margaret Spencer Home, for the Oxford Regional Hospital Board, H. Martin Ltd., £2,879.

Swindon. Electrical work in new operating theatre at Victoria Hospital, for Oxford Regional Hospital Board, Southern Electricity Board, £1,711.

PRICES OF CABLE METALS AND OTHER MATERIALS
(at Tuesday night)

	£ s. d.	New York price
COPPER, electrolytic	227 0 0	£220 0 0
LEAD, good soft pig (foreign)	180 0 0	136 0 0
" " " "English" quality	181 10 0	
Tin (99·99·75%) ... ...(Cash)	915-920	—
" (3 months)	875-885	—
ALUMINIUM, commercial purity (del.)	124 0 0	—
ZINC	190 0 0	140 0 0
ARMOURING:		
Galv. Steel Wire (0·104 in.)	55 5 0	—
Mild Steel Tape (0·04 in.)	32 5 0	—

GAZETTE ANNOUNCEMENTS

COMPANIES ACTS

Notice is given that the names of the following companies have been struck off the Register: Economic Refrigeration Co. Ltd.; Electronics (Enfield) Ltd.; Sharpe's Electrical and Domestic Utilities Ltd.

Notice is also given that at the expiration of three months the names of the following companies will be struck off the Register and the companies dissolved: Day-Glow Fluorescent Lighting Installations Ltd.; Megaphos Ltd.; Rutt Power Units Ltd.

Super Tools Ltd. Creditors to send particulars to E. J. H. Clarke, liquidator, 135 Chiswick High Road, W.4, by October 1. Meetings of members and creditors at that address on October 22 at 11 and 11.30 a.m.

U. V. Beams Ltd. Petition for winding-up, presented by the General Electric Co. Ltd., to be heard at Royal Courts of Justice, Strand, London W.C, on October 8. Persons intending to appear to notify Cochrane and Cripwell, solicitors, 119 Finsbury Pavement, E.C.2, by October 6.

Square Deal Radio Co. Ltd. Resolution for voluntary winding-up passed at meeting on September 3, Mr. Archibald William Hunter, 185-188 High Holborn, W.C.1, appointed liquidator.

W. G. Hodges Ltd., radio and electrical engineers. Liquidator, Mr. C. R. Blissett, Waterloo Chambers, Fir Vale Road, Bournemouth.

BANKRUPTCY ACTS

Dividend

Stockton-on-Tees. Henderson, electrician, lately of 82A Galgate, Barnard Castle. First and final dividend of 1s. 2½d. in £, payable on September 26 at Official Receiver's Office, 4 Bridge Road, Stockton-on-Tees.

Private Arrangement

J. W. Jones, 144 Conway Road, and Ivy Street, Colwyn Bay, electrical contractor, at a meeting of creditors a statement of affairs was presented showing liabilities amounting to £4,791. The assets, including the debtor's house, life policy and furniture, were estimated to produce £7,389, and after allowing £784 for preferential claims there were net assets of £6,605, or a surplus of assets over liabilities of £1,813. The debtor, who commenced the business on his own account in 1946, had been experiencing pressure from creditors for some time. Five creditors had obtained judgment and as debtor was unable to obtain the necessary funds he consulted his solicitors with the result that the meeting of creditors was convened. After discussing the position, it was decided that the matter should be dealt with under a Deed of Assignment in favour of Mr. S. O. Henry, accountant, of Parkin S. Booth and Co., 5 Rumford Place, Liverpool, as trustees of the estate. A committee of inspection was also appointed.

TRADE NOTES

New Branch. The Sun Electrical Co. Ltd. has opened a new branch at 261 Water Lane, Abbeydale Road, Wembley, Middx. Telephone: Perivale 0561.

Phone No. The Boscawen, Truro, depot of the Sloan Electrical Co. has now received its telephone installation, the number being Truro 3661.

Change of address. The Lighting Division of Thorn Electrical Industries Ltd. has moved its offices to 233 Shaftesbury Avenue, W.C.2. Telephone: Temple Bar 1599. Later in the year, a showroom will be opened there.

Wilkins and Mitchell Ltd. have formed Wilkins and Mitchell (Ireland) Ltd. with head office at 91b Rathgar Road, Dublin. The primary purpose of this company will be the maintenance and service of "Servis" washing machines. Commercial manager in Dublin is Mr. G. J. Osborne.

B.E.A.M.A. Contract Price Adjustment Formulae. For purposes of calculating variations in:—(*a*) "Rates of Pay"—the rate of pay for adult male labour at September 15, 1951, shall be deemed to be 120/-. (*b*) "Cost of Material"—the index figure for Intermediate Products last published by the Board of Trade on September 15, 1951, is 371.4 and is the figure for the month of August, 1951.

Expansion. Honeywell-Brown Ltd. have applied to the Board of Trade for sanction to extend their Blantyre factory where various electrical instruments and controls are manufactured.

BUSINESS PROSPECTS

HOME

Alcester R.D.C. Erection of 12 houses at Crooks Lane. F. B. Andrews, Borough Architect, 95 Colmore Row, Birmingham.

Altrincham T.C. Construction of 97 houses and flats at Broomwood estate. Borough Surveyor, Town Hall.

Ashby-de-la-Zouch R.D.C. Erection of 30 houses at Coronation site, Oakthorpe. V. G. Bott, architect and engineer, Council Offices, South Street.

Billingham-on-Tees. Imperial Chemical Industries Ltd. are to extend the offices at the Nylon Works and also erect a canteen for 424 people. No contracts have been placed.

Bolton T.C. Erection of proposed High Lawn County Primary School, for 240 pupils. Borough engineer and surveyor, Town Hall.

Brighouse T.C. Erection of 20 houses, 7 flats and 5 shops at Stoney Lane estate, Lightcliffe. H. A. Sneezum, Engineer and Surveyor.

Bristol T.C. Erection of 34 houses at Henbury. City architect, Eagle House, Colston Avenue.

Burton-upon-Trent T.C. Construction of second instalment of Hillside Secondary Modern School. Borough surveyor, Town Hall.

Cardiff T.C. Construction of new county primary junior school at Fairwater. Quantity surveyor, L. C. Patterson, 11 Cathedral Road, Cardiff.

Chesterfield T.C. to build 70 houses on the Calow Lane estate and a further 96 on the Newbold estate. Plans by borough architect. A start is to be made this year on the first instalment of the £200,000 scheme for a technical college extension.

Driffield U.D.C. Erection of 40 houses at Northfield Road estate. A Hornby, clerk of the council.

Eastbourne. Strange and Printer Ltd., York Road, propose to establish factory at 1 Commercial Road. Applying to B.o.T. for £24,000 licence. Architect, H. H. Ford, 24A Cornfield Road, Eastbourne.

Ellesmere Port U.D.C. Erection of 32 bungalows at Orchard Farm estate. Engineer and surveyor, Queen Street.

Farnborough (Hants). Container Reclamation Co., 82-94 Seymour Place, W.1., to building 30,000 sq ft factory at Hawley Lane.

Grantham T.C. Erection of 16 brick bungalows at Harrowby Lane. Borough engineer and surveyor, Guildhall.

Grimsby T.C. Erection of branch library at Nunsthorpe estate. J. V. Oldfield, engineer and surveyor, Municipal Offices.

Harrogate T.C. Erection of 24 houses at Eleanor Road and 24 aged persons' flats at Grove House. L. H. Clarke, borough engineer, Municipal Offices, Harrogate.

Hartlepool. The borough engineer (R. H. Snowball) has prepared plans for 10 shops and 11 houses at West View, Hartlepool, for the T.C. and tenders are being obtained. Quantity surveyors, Hall and Stafford, Sunniside Chambers, Sunderland.

Hendon. The National Cash Register Co. Ltd., 206 Marylebone Road, N.W.1, propose to erect factory at North Circular Road for the repair of machines. Architects, J. Stanley Beard, Bennett and Wilkins, 101 Baker Street, W.1.

Hendon B.C. Erection of 55 houses at Kenilworth Road, Edgware. Borough engineer and surveyor, Town Hall.

Hexham. W. Dixon and Son, 1 Collingwood Street, Newcastle-on-Tyne, have been asked to prepare plans for 22 houses at Ovington for the R.D.C.

Inverness. Regent Oil Co., 117 Park Street, London, W.1, to erect fuel depot at Cromwell Road. Estimated cost £10,000.

Isle of Man. Onchan Village Commissioners to erect 44 all-electric houses at Ballachrink estate.

Lincolnshire C.C. Construction of 18 firemen's houses at Harlaxton Road, Grantham. J. W. H. Barnes, county architect, County Offices, Sleaford, Lincs.

Litherland U.D.C. Erection of 82 houses and 18 old age pensioners' bungalows at Netherton Park estate. Architects, O. Williams Sutcliffe, 24 Dale Street, Liverpool.

Long Eaton U.D.C. Erection of 36 houses at Petersham Road. F. Turner, engineer and surveyor, Town Hall.

Malden and Coombe. One block of 18 flats at Coombe Road. Borough engineer, Municipal Offices, New Malden.

March (Cambs.) U.D.C. to build a further 16 houses at Badgeney-Deerfield estate. Plans by the Council's Architect and Surveyor.

Melton Mowbray U.D.C. Erection of 20 houses at Dorothy Avenue site. P. B. Sutton, Engineer and Surveyor, Egerton Lodge.

Merionethshire C.C. Erection of a three-class primary school at Llanuwchllyn, near Bala. N. L. Jones, county architect, County Office, Dolgelley.

Middlesex C.C. Erection of ambulance station at Hillingdon. C. W. Radcliffe, county clerk, Guildhall, Westminster, S.W.1.

Newcastle - on - Tyne. E.C.'s scheme for new Rutherford Grammar School to accommodate 680 pupils is out to tender. A contract is expected to be settled early in December. Plans are by the Education Section, City Architect's Dept., 18 Cloth Market, Newcastle-on-Tyne.

Ongar R.D.C. Erection of 22 houses at Shelley estate. Engineer and surveyor, Bowes Field, High Street, Chipping Ongar.

Orrell U.D.C. Erection of 24 houses at Kit Green site. Engineer and surveyor, Council Offices, Orell Post, near Wigan.

Plymouth T.C. Erection of 48 three-storey flats in three blocks at Whitleigh, and 7 bungalows at Ernesettle. H. J. W. Stirling, city architect, Seymour Road, Plymouth. Tenders also invited for construction of primary school for 240 pupils at Lipson. Apply to architects, Louis de Soissons and Partners, 5 Portland Square, Plymouth.

Preston T.C. Erection of 144 flats at Larches estate. Borough surveyor, Municipal Building.

Salford T.C. To proceed with erection of grammar schools at Cloremont. Estimated cost £250,000. Plans being prepared by Taylor and Young, architects, 195 Oxford Road, Manchester 13.

Stockton-on-Tees. The R.D.C. is to erect 22 houses at Greatham and tenders are being invited.

Sunderland. The T.C. has received sanction to borrow £8,859 for replacing gas with electric lighting in six schools.

Westhoughton (Lancs). Erection of 24 houses at Hindley's Estate. Architect, F. Bradley, 4 Wood Street, Bolton.

Worksop R.D.C. Erection of 20 houses at Harworth. Architect, B. D. Thompson, 83 Bridge, Worksop.

OVERSEAS

Peru. Senor Julio Gylling of Calle Puente Bolognesi 221 (Casilla 519), Arequipa, wishes to receive catalogues and price lists from United Kingdom manufacturers of radio sets and radiograms.

Senor Carlos Lucioni Romero of Calle Ejercicios 118 (Casilla 597), Arequipa wishes to receive catalogues and price lists from United Kingdom suppliers of electric irons and toasters of cheap and medium quality, suitable for operating on a.c. 110 and 220V.

South Africa. Findlay, Durham and Brodie, 6 Bloomsbury Square, London W.C.1 (Ref. CAP), wish to obtain supplies of 10/15 A firemen's switches for neon signs, for South Africa.

TRADE MARKS

This information is extracted from the Official Journal by permission of the Controller.

Activette. B699,118. Class 9. Electric apparatus for re-energising dry batteries. Amplion (1932) Ltd., 230 Tottenham Court Rd., London W.1.

Cyclorel. 699,316. Class 9. Electronic devices for the operation and control of resistance welding apparatus. Ateliers de Constructions Electriques de Charleroi, 33 Rue du Congres, Brussels.

Ceilux. 699,458. Class 11. Lighting fittings. Teeanee Ltd. trading also as Tucker and Edgar, Berkeley Works, Berkeley Rd., London N.W.1.

Dimafon. 699,884. Class 9. Dictating machines and sound recording machines. John Kimbell and Co. Ltd., 146 Grosvenor Rd., Westminster, London S.W.1.

Fernbrook. B697,681. All goods in Class 8. Arvin Electric Ltd., 37/40 Fernbrook Ave., Southend-on-Sea.

Hydel. 699,417. Class 7. Electro-magnetically actuated mechanisms for use in hydraulic systems in the control of aircraft. Dowty Equipment Ltd., Arle Court, Cheltenham, Gloucester.

NEW COMPANIES

Extracted from the Register issued by Jordan and Sons, Ltd., 116 Chancery Lane, London W.C.2.

Beam Engineering Products, Ltd., 27 Blandford St., Sunderland. Manufacturers of and dealers in plant, machinery, appliances and apparatus capable of being used in the food, drink, general bottling and packing trades, etc. Cap.: £500. Permanent dir.: H. Wright and Mrs. E. Wright.

I. Cooklin Ltd., 141 Moorgate E.C.2. Manufacturers of and dealers in electric, radio and television apparatus and appliances, etc. Cap.: £500. Dir.: I. Cooklin.

Fife Radio and Television Ltd. Cap.: £10,000. Dirs.: to be appointed by subs. Subs.: P. J. D. Flynn and C. D. Smith, West Hill Place, Balcombe, Sussex.

Humidity Control Ltd., 12-14 Underwood St., City Rd., N.1. Heating, ventilating and air conditioning engineers, etc. Cap.: £25,000. Dirs.: to be appointed by subs. Subs.: S. Rothman and H. Wyner.

Hadley Sound Equipments Ltd., 72 Cape Hill, Smethwick, Staffs. Manufacturers of and dealers in wireless goods, etc. Cap.: £12,500. Dirs.: V. J. Hadley, N. C. Hadley.

Gregg Electrical Industries Ltd., 25a Albert St., Birmingham 4. Cap.: £100. To manufacture, export, import and deal in Gregg electrical accessories, etc. Dirs.: W. G. D. Gregg, L. Ballard, W. Barrow and J. Fielden.

Joy-Scott Refrigeration Co. (Western) Ltd. Manufacturers of refrigerators, etc. Cap.: £100. Dirs.: To be appointed by subs. Subs.: W. J. E. Lee, 99 The Chine, Grange Park, N.21; H. S. Howall, 12 Elm Park Rd., N.21.

Key Developments Ltd., 4 Queen Victoria St., E.C.4. Manufacturers of and dealers in fibrous and plastic conduit, drain and other pipes, etc. Cap.: £100. Dirs.: J. E. Ordish, F. V. Wickham, F. Pooley, D. D. Sellon and J. B. Sidford.

Channing Milbourne Ltd., 19-21 Newbury St., Aldersgate St., E.C.1. Electrical and general engineers and contractors, etc. Cap.: £1,000. Dirs.: H. C. Quitmann, Mrs. J. J. Quitmann, Miss H. M. Quitmann.

R. and E. (Manufacturing), Ltd., The People's Palace, Pydar St., Truro, Cornwall. Manufacturers of and dealers in refrigerators and refrigerating plant, etc. Cap.: £100. Dirs.: A. North, J. E. A. Parkin.

Mercury Instruments Ltd., 13 St. Swithin's Lane, E.C.4. To acquire, manufacture, deal in, repair, transfer or sell metal dial and profile, exhaust, and cooling and other thermometers, used in connection with shipbuilding, engineering, refrigerating, etc. Cap.: £100. Dirs.: D. Geddes, Jun.; T. P. Juncker.

Quayside Engineering Co. Ltd., Brougham St., Stockton-on-Tees, Co. Durham. Heating, air conditioning, marine, mechanical and electrical and general engineers, etc. Cap.: £500. Dirs.: N. McLeod and Mrs. N. McLeod.

Winns (Radiators) Ltd., Branbridges, Paddock Wood, Kent. Electrical and mechanical engineers, manufacturers of and dealers in internal combustion, Diesel, Diesel-electric, gas, oil and air engines and parts thereof, etc. Cap.: £10,000. Dirs.: to be appointed by subs. Subs.: Miss L. A. Newstead and Evelyn G. Bourne.

MEETINGS TO NOTE

THURSDAY, SEPT. 20

WORCESTER ELECTRIC CLUB.—"Motor Control Gear." R. F. Mathieson. Talbot Hotel, Tything, 7.15 p.m.

WEDNESDAY, SEPT. 26

I.E.E. (N. Mid and Centre). Conference: "Electricity as an Aid to Productivity". Two sessions beginning 10.15 a.m. Great Hall, Leeds University.

THURSDAY, SEPT. 27

INCORP. PLANT ENGRS. (S. Yorks Branch).—"Electronics in Industry," by B.T.H. Ltd., Grand Hotel, Sheffield, 7.30 p.m.

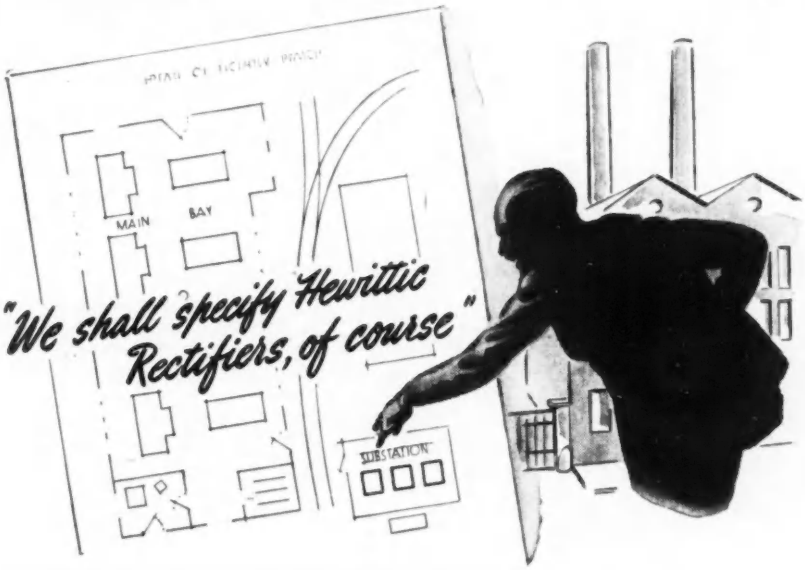
I.E.S. (Nottingham Centre).—Annual luncheon and induction of chairman. Victoria Station Hotel, 5.30 p.m.

I.E.S. (Bradford Group).—"Lighting of Trains and Public Service Vehicles." S. Anderson and C. Dykes Brown. Y.E.B., 45-53 Sunbridge Rd., 7.30 p.m.

PURCHASING OFFICERS' ASSCN. 3-day conference opens at Craigside Hydro, Llandudno.

FRIDAY, SEPT. 28

I.E.S. (Leeds Centre). Chairman's address.—J. Sewell. Guildford Hotel, The Headrow, 7 p.m.



Hewittic Rectifiers

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FOR D.C. supply to industrial works . . . to operate cranes and conveyors, all variable speed D.C. motor-driven machinery, magnetic equipment, electrolytic plant . . . it is obviously wise to specify converting plant that is supremely reliable, easily installed in the smallest possible space, highly economical, requires negligible maintenance and operates COMPLETELY UNATTENDED.

These requirements are fully met by HEWITTIC RECTIFIERS, which are supplied up to any capacity, for the heaviest service, e.g., operating steel rolling mills and electric traction systems, or in small units for such applications as battery charging for works electric vehicles.

Hewittic rectifiers are also ideal to replace obsolete rotary converting plant or local D.C. generating equipment, providing a greater D.C. output in the same floor space.

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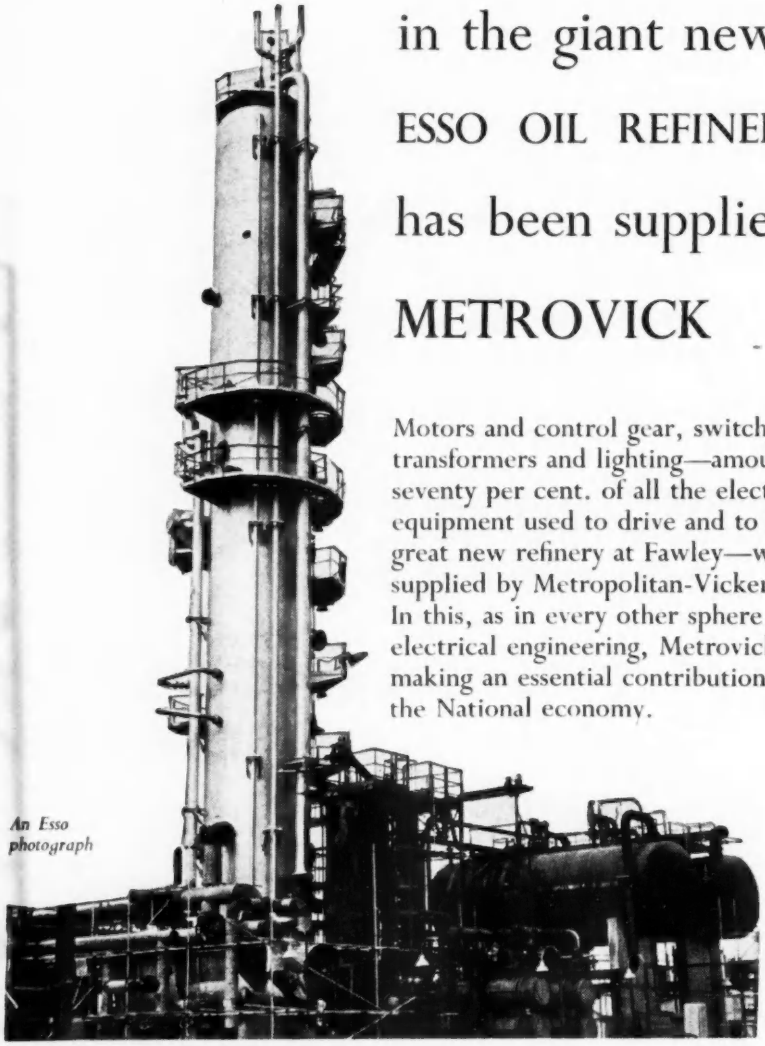
Telephone: Walton-on-Thames 760 (8 lines) Telegrams: "Electric," Walton-on-Thames

Most of the ELECTRICAL EQUIPMENT in the giant new ESSO OIL REFINERY has been supplied by METROVICK



An Esso photograph

Motors and control gear, switchgear, transformers and lighting—amounting to seventy per cent. of all the electrical equipment used to drive and to light the great new refinery at Fawley—were supplied by Metropolitan-Vickers. In this, as in every other sphere of electrical engineering, Metrovick are making an essential contribution to the National economy.

METROVICK *Providing Power for Production*

METROPOLITAN-VICKERS ELECTRICAL COMPANY LIMITED
Trafford Park, Manchester, 17. *Member of the A.E.I. group of companies.*

G20

CLASSIFIED ADVERTISEMENTS

OFFICIAL TENDERS AND APPOINTMENTS

WANTED · FOR SALE WORK WANTED

Those wishing to advertise in these pages should send the text to the Classified Advertisement Dept., Electrical Times, Sardinia House, Sardinia St., London W.C.2, before 10 a.m. on TUESDAY of week of issue. Official Displayed Advertisements are charged at 42s. per inch, and all other classified advertisements at 3s. 0d. per line. Situations Wanted will be published four times for twice the single insertion rate. Fee for Box No. and postage on replies is 2s.

TENDERS INVITED

NORTH OF SCOTLAND HYDRO-ELECTRIC BOARD

STRICHEN AREA DISTRIBUTION

TENDERS are invited for the supply, delivery and erection of 11kV and lower voltage WOOD POLE LINES in the north-east of Aberdeenshire.

The work will be divided into three contracts and tenderers may quote for one or more contracts simultaneously at their option. Copies of the Tender Documents may be obtained on application to the Engineers, Messrs. Merz and McLellan, 39 Northumberland Street, Edinburgh 3, on and after September 29, 1951. Applications should be accompanied by a cheque for £1 1s. (returnable) in respect of each of the three contracts for which it is desired to tender.

The Board do not bind themselves to accept the lowest or any tender.

W. D. D. FENTON,
Secretary.

16 Rothesay Terrace,
Edinburgh 3.
September 11, 1951. (M 113)

OSWALDTWISTLE URBAN DISTRICT COUNCIL

PUBLIC LIGHTING SCHEME, 1951-52

TENDERS are invited for the installation and erection of 50 400 W and 25 135 W h.p.m.v. ELECTRIC COLUMN AND BRACKETS in connection with the abovementioned scheme.

Conditions of contract, specifications and form of tender may be obtained on application to T. D. Manning, M.I.Mun.E., Engineer and Surveyor, Town Hall, Oswaldtwistle.

The Council does not bind itself to accept the lowest or any tender.

H. DUXBURY,
Clerk to the Council.

Town Hall,
Oswaldtwistle. (M 138)

APPOINTMENTS VACANT

CROWN AGENTS FOR THE COLONIES

ELECTRICAL SUPERVISOR required by the Government of Kenya for the Public Works Department, for one tour of four years. Salary according to age and experience in the scale £740 rising to £1,080 a year, plus temporary allowance between £99 and £116 a year, according to salary. Outfit allowance, £30. Free passages. Gratuity of 13½ per cent. of total substantive salary payments will be payable on satisfactory completion of service. Candidates, under 45 years, must have served an apprenticeship with a firm of electrical contractors and have had subsequent experience as a chargehand and foreman. They should preferably have technical qualifications up to at least Higher National Certificate, and should have had experience in the preparation of schemes for electrical installations in all types of single and multi-storeyed buildings, estimating the cost and preparing bills of quantities. They should be capable of dealing with correspondence, general administration and supervising large labour forces engaged on such works.

Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper, to the Crown Agents for the Colonies, 4 Millbank, London S.W.1, quoting M.28861.B on both letter and envelope. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (M 142)

NORTH WESTERN ELECTRICITY BOARD

No. 5 Sub-Area

SECOND ASSISTANT ENGINEER
(MAINS CONSTRUCTION)

APPLICATIONS are invited for the appointment of Second Assistant Engineer (Mains Construction) in the Sub-Area Mains Engineer's Department at the No. 5 Sub-Area Headquarters, Jubilee Street, Blackburn.

Applicants should have had considerable experience in the planning and construction of overhead and underground lines for voltages up to and including 33kV. Experience of the construction and equipment of transformer sub-stations and the planning of distribution network is also necessary.

Corporate membership of the Institution of Electrical Engineers will be an advantage.

The salary for the post will be in accordance with the National Joint Board Revised Agreement, Class "J," Grade 7, i.e., £736/753/770 per annum.

SECOND ASSISTANT ENGINEER
(OPERATION AND MAINTENANCE)

Applications are invited for the appointment of Second Assistant Engineer (Operation and Maintenance) in the Sub-Area Mains Engineer's Department at the No. 5 Sub-Area Headquarters, Jubilee Street, Blackburn.

Applicants should have had a wide experience in the operation and maintenance of high voltage and low voltage networks, including both overhead lines and underground cables of voltages up to and including 33kV, also high voltage testing and fault localisation.

Corporate membership of the Institution of Electrical Engineers will be an advantage.

The salary for the post will be in accordance with the National Joint Board Revised Agreement, Class "J," Grade 7, i.e., £736/753/770 per annum.

SECOND ASSISTANT DISTRICT ENGINEER
(ROSSENDALE DISTRICT)

Applications are invited for the appointment of Second Assistant District Engineer in the Rossendale District of the No. 5 Sub-Area.

The salary for the post will be in accordance with the National Joint Board Revised Schedule, Class "E," Grade 7, i.e., £579/594/609 per annum.

The successful candidate will be required to assist in the operation, maintenance and construction of underground and overhead mains, sub-stations and transformers and general mains duties, and to undertake standby duties.

Preference will be given to candidates who are Corporate or Graduate Members of the Institution of Electrical Engineers, or who possess the Higher National Certificate in Electrical Engineering.

Applications for the above posts, stating age, qualifications and experience, present post and salary, should be received by R. H. Harral, M.I.E.E., M.Inst.F., Sub-Area Manager, No. 5 Sub-Area, The North Western Electricity Board, Jubilee Street, Blackburn, not later than Saturday, September 29, 1951. (M 115)

SOUTH EASTERN ELECTRICITY BOARD

GENERAL ASSISTANT ENGINEER—
Dover District

SALARY of £375 per annum to £383 per annum under N.J.B. Schedule, Class "D," Grade 13. Superannuation will be arranged. Applicants should hold the Higher National Certificate, have had a sound training in electrical engineering, and experience in the construction, operation and maintenance of underground and overhead systems up to 11 kV.

Applications, giving two referees, must reach R. G. Widgery, A.M.I.E.E., Dover Manager, SEEBoard," Ladywell, Dover, by October 1, 1951.

A. L. BURNELL,
Secretary.

September, 1951. (M 149)

COUNTY COUNCIL OF THE WEST RIDING OF YORKSHIRE

County Architect's Office

APPLICATIONS are invited for the appointment of a SENIOR ASSISTANT ELECTRICAL ENGINEER, Grade A.P.T. IX, salary range £790 by £40 to £910. Candidates must be Corporate Members of the Institution of Electrical Engineers, with sound training in electricity supply and installation, and have had considerable experience in the design and layout of electric lighting and power installations and the preparation of specifications and estimates of cost, for work to large buildings. Sound organising ability is essential.

The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, as amended by the W.R.C.C. (General Powers) Act, 1948, and to the conditions of service at present in operation by the County Council. The successful candidate will be required to pass a medical examination.

Applications, on forms obtainable from this office, must be delivered not later than the first post on Monday, October 8, 1951.

H. BENNETT, F.R.I.B.A.,
County Architect.

Bishopgarth, Westfield Road,
Wakefield. (M 139)

CROWN AGENTS FOR THE COLONIES

ELECTRICAL DRAUGHTSMAN required by the Government of Kenya for one tour of four years in the first instance. Salary according to qualifications and experience in scale £670, rising to £840 a year, plus a temporary allowance between £96 and £104 a year, according to salary. Free passages and liberal leave on full salary. Gratuity of 13¼ per cent. of total substantive salary payments during engagement will be payable on satisfactory completion of service. Outfit allowance £30. Candidates, not over 32 years, must have been trained in a drawing office, have a sound knowledge of the Institution of Electrical Engineers Regulations; and be capable of preparing layout drawings, under the general supervision of a senior engineer, of electrical installations in both multi-storey and single-storey domestic and industrial premises and public buildings. They must be capable of supervising a small drawing-office staff.

Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper, to the Crown Agents for the Colonies, 4 Millbank, London S.W.1, quoting M.28860.B on both letter and envelope. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (M 143)

SOUTHERN ELECTRICITY BOARD

APPLICATIONS are invited for the following post:—

FIELD ENGINEER

Construction Department of No. 3 (Portsmouth) Sub-Area, based at Farnborough. Salary, N.J.B. Class "J," Grade 13, Column 1 (£486 per annum). N.J.B. conditions of service.

Candidates should have ability to supervise the erection of 33 kV and 11 kV and l.v. overhead lines, laying and jointing of h.v. and l.v. cables and equipment of 33-11 kV substations.

The successful candidate will be required to join the B.E.A. and Area Boards' Superannuation Scheme, if eligible.

Applications on forms obtainable from the Sub-Area Secretary, Lower Drayton Lane, Cosham, Portsmouth, and returned to him in envelopes endorsed "Field Engineer," not later than October 1, 1951.

F. W. KEMPTON,
Secretary.

September 20, 1951. (M 140)

SUDAN GOVERNMENT

THE Equatoria Projects Board have a vacancy for a young MECHANICAL ENGINEER with a thorough practical engineering training and a wish to learn and widen his experience. Ordinary National Certificate or equivalent technical qualifications required.

Age limit about 27.

Two years contract. Salary up to £E.648 according to age, with a post service gratuity of two months' salary and three and a half months' leave on full pay. A cost of living allowance varying between £E.142 for a single man and £E.352 for a married man with dependants, is at present payable. £E.40 outfit allowance payable on first appointment. There is at present no income tax in the Sudan.

Further particulars and application form may be obtained, on written application, from The Sudan Agent in London, Wellington House, Buckingham Gate, London, S.W.1.

Please mark envelopes "Engineer E.P.B. 4/2301." (M 17)

BRITISH ELECTRICITY AUTHORITY

North Western Division

APPLICATIONS are invited for the following positions :

No. 556. STATION SHIFT CONTROL ENGINEER
Bury Generating Station, Chamber Hall, Bury.

The salary will be within the range £488/502 per annum, in accordance with Grade 10, Class E.

Candidates should preferably possess technical qualifications, and previous experience in a generating station is desirable.

No. 557 SHIFT CHARGE ENGINEER
Greenhill Generating Station, Greenhill, Oldham.

The salary will be within the range £579/609 per annum, in accordance with Grade 7, Class "E."

Candidates should preferably possess technical qualifications, and previous experience in a generating station is essential.

Both these positions are superannuable, and the salaries are in accordance with the National Joint Board Agreement.

Applications, quoting vacancy number, stating age, qualifications, present position, and giving full details of education and experience, should be received by the Establishment Officer, British Electricity House, Wilmslow Road, East Didsbury, Manchester 20, not later than October 1, 1951. (M 117)

BRITISH ELECTRICITY AUTHORITY

SPECIFICATIONS AND CONTRACTS ENGINEER
GENERATION CONSTRUCTION SUB-DEPARTMENT—HEADQUARTERS

APPLICATIONS are invited for the appointment of Specifications and Contracts Engineer in the Generation Construction Sub-Department at the Authority's Headquarters in London.

The successful candidate will be responsible to the Deputy Chief Engineer (Generation Construction) for those aspects of specifications and contracts work on power station construction which are dealt with in the Chief Engineer's Department.

Candidates should be corporate members of either the I.E.E., I.Mech.E., or Inst.C.E., and have had wide up-to-date experience in handling contracts of the types associated with the construction of modern power stations both from the engineering and commercial aspects. A full knowledge of contract procedure and field experience of major contracts is also essential and only those possessing such qualifications need apply.

The salary for the appointment, which is superannuable, will be within the provisional range £1,750/2,000 p.a., including London Allowance, and the starting salary will be in accordance with qualifications and experience.

Applications, stating age, present salary and giving full details of qualifications and experience, should be forwarded to D. Moffat, Director of Establishments, British Electricity House, Great Portland Street, W.1, not later than October 6, 1951.

Please quote reference AE/202. (M 116)

BRITISH ELECTRICITY AUTHORITY

London Division

SHIFT ASSISTANT ENGINEER (OPERATION)
Deptford East Generating Station

APPLICATIONS are invited for the above position, which is superannuable.

The successful candidate will be responsible for all turbine house operations and should be fully experienced in the running-up, shutting-down and loading of h.p. turbo-alternators and ancillary equipment.

Salary in accordance with N.J.B. Schedule, Class "H," Grade 13, £480 18s. per annum, inclusive of London allowance.

Applications, stating age, qualifications and experience, should be addressed to the Divisional Secretary, British Electricity Authority, London Division, Ergon House, Horseferry Road, Westminster, S.W.1, to be received within 14 days of the appearance of this advertisement.

J. N. WAITE,
Divisional Controller.
(M 141)

BRITISH ELECTRICITY AUTHORITY

South Eastern Division

SECOND ASSISTANT CHEMIST required at Croydon "A" Power Station. Applicants should possess a B.Sc. or A.R.I.C. Degree and should have had experience in fuel testing, water analysis and lubricating oil testing. Experience of modern power station installations an advantage. N.J.B. conditions of service and salary Class "F," Grade 11, £482 to £498 per annum plus London Allowance.

Applications on forms obtainable from Divisional Secretary, B.E.A., S.E. Division, Lower Ham Road, Kingston-upon-Thames, to be received not later than October 3, 1951. (M 130)

SUDAN GOVERNMENT

THE Equatoria Projects Board require a MECHANICAL ENGINEER having a practical knowledge of l.t. alternating current generation and distribution. Must have had a practical mechanical engineering training with subsequent experience with the running and maintenance of oil and gas engines. Higher National Certificate or equivalent technical qualifications required.

Age about 35.

Two years contract. Salary up to £E.948 according to age with a post service gratuity of two months' salary and three and a half months' leave on full pay. A cost of living allowance, varying between £E.142 for a single man and £E.352 for a married man with dependants, is at present payable. £E.60 outfit allowance payable on appointment. There is at present no income tax in the Sudan.

Further particulars and application form may be obtained on written application from the Sudan Agent in London, Wellington House, Buckingham Gate, London, S.W.1.

Please mark envelopes "Mech.Elect.Engineer F.P.B. 4/2301." (M 16)

SOUTH WEST SCOTLAND ELECTRICITY BOARD

Ayrshire Sub-Area

APPOINTMENT OF DISTRICT ENGINEER

APPLICATIONS are invited for the position of District Engineer in the Mauchline District of the above Sub-Area.

Applicants should have received a sound technical and practical training, and have long and comprehensive experience including planning, construction, operation and maintenance of overhead and underground networks and sub-stations up to and including 33 kV.

Corporate Membership of the Institution of Electrical Engineers or equivalent qualifications desirable.

Salary in accordance with the N.J.B. Agreement, Class "C," Grade 2, £769–£797 per annum, and the position superannuable in accordance with the B.E.A. and Area Boards' Scheme.

An attractive four-room bungalow will be available, situated in Mauchline, to the successful married candidate at a yearly rental of £25 10s.

Applications, stating age, whether married or single, qualifications and giving full details of education, training, experience and present position, to be sent to the Manager, The South West Scotland Electricity Board, Greenholm Street, Kilmarnock, with 14 days of the appearance of this notice.

A. E. ROOTS,
Manager.

September 12, 1951. (M 114)

BRITISH ELECTRICITY AUTHORITY

East Midlands Division

SHIFT CONTROL ENGINEER, COVENTRY

APPLICATIONS are invited for the position of Shift Control Engineer at Longford Generating Station, Coventry.

Applicants should have had a sound training and practical experience in a modern Generating Station. The possession of a Higher National Certificate in Electrical Engineering, or its equivalent, would be advantageous.

The salary will be in accordance with Class "G," Grade 10, of the National Joint Board Schedule, and the post will be superannuable within the terms and conditions of the British Electricity Authority and Area Boards' Superannuation Scheme.

Applications should be submitted on the official form, which may be obtained from the Divisional Establishments Officer, British Electricity House, Barker Gate, Nottingham, and should be delivered to the undersigned not later than September 26, 1951.

L. F. JEFFREY,
Divisional Controller.
(M 76)

BRITISH ELECTRICITY AUTHORITY

South Eastern Division

DIVISIONAL Headquarters staff. SECOND ASSISTANT ENGINEER (Mechanical). Applicants should have had experience in the mechanical maintenance of modern high pressure power station plant, including large turbines, boilers, pumps, convevors, lifting gear, etc., and should preferably be Corporate Members of the Institute of Mechanical Engineers. Class "AX," Grade 2, £789 12s. per annum. THIRD ASSISTANT ENGINEERS (Mechanical). Applicants should have had extensive practical experience in the erection and maintenance of either boiler plant or turbine plant with their auxiliaries. Class "AX," Grade 5, £607 19s. per annum. N.J.B. conditions of service and salary for both positions. Salaries quoted include London allowance. Applications, on forms obtainable from Divisional Secretary, British Electricity Authority, South Eastern Division, Lower Ham Road, Kingston-upon-Thames, to be received by October 3, 1951. (M 160)

BRITISH ELECTRICITY AUTHORITY

Eastern Division

APPLICATIONS are invited for the following appointment in the Technical (Electrical) Department at Divisional Sub-Headquarters, West Farm Place, Cockfosters:—

GENERAL ASSISTANT ENGINEER (Communications Section)

The duties of the post will be assisting with the installation, maintenance and testing of communications equipment in generating stations and sub-stations.

Applicants should be Graduate or Corporate Members of the Institution of Electrical Engineers and experience with carrier current telephony channels and the adjustment of automatic switchgear would be an advantage.

Salary range in accordance with the N.J.B. Agreement, Schedule "C," Grade 8, Class "AX" (£437 to £569 per annum plus London Weighting).

The commencing salary will depend upon qualifications and experience.

The appointment will be superannuable in accordance with the British Electricity Authority and Area Boards' Superannuation Scheme.

Forms of application may be obtained from the Divisional Controller, British Electricity Authority, Eastern Division, Northmet House, Southgate, N.14, to whom completed forms should be sent to arrive not later than October 12, 1951. Envelopes should be endorsed "General Assistant Engineer (Communications Section)."

W. N. C. CLINCH,
Controller.

Northmet House,
Southgate, N.14. (M 75)

BRITISH ELECTRICITY AUTHORITY

Midlands Division

APPLICATIONS are invited for the following positions at Ironbridge Generating Station, Ironbridge, Shropshire:—

(a) BOILER HOUSE SHIFT CHARGE ENGINEER, Class "H," Grade 9, commencing salary £809 per annum.

(b) STATION SHIFT CONTROL ENGINEER, Class "H," Grade 10, commencing salary £571 per annum.

Candidates for (a) should possess Higher National Certificate in mechanical or electrical engineering or an equivalent qualification, should have received a sound technical training, and have had considerable experience of combustion and the operation of h.p. boiler plant.

Applicants for (b) should possess the Higher National Certificate in electrical engineering or an equivalent qualification, and should have had sound technical training and practical experience in the control and operation of steam generating plant and main switchgear.

Conditions of service will be in accordance with the N.J.B. Agreement, and superannuation under terms approved by the British Electricity Authority.

Forms of application may be obtained from the Establishments Officer, 53 Wake Green Road, Moseley, Birmingham 13, and should be returned not later than October 13, 1951.

F. W. LAWTON,
Divisional Controller.
(M 146)

BRITISH ELECTRICITY AUTHORITY

Yorkshire Division

APPLICATIONS are invited for the appointment of POWER STATION SUPERINTENDENT at Huddersfield Power Station.

Applicants should have had a wide experience in the operation and maintenance of large modern power station plant and have held a position of responsibility involving the control of technical and administrative staff.

Preference will be given to engineers who are Corporate Members of the Institute of Electrical Engineers and/or the Institute of Mechanical Engineers, or who hold the necessary qualifications for membership.

Conditions of service and salary will be in accordance with the National Joint Board Agreement (Schedule "A"), Class "F," Grade 1, £999 to £1,045 per annum. The appointment will be subject to the provisions of the Authority's Superannuation Scheme.

Forms of application may be obtained from the Divisional Secretary, British Electricity Authority, Yorkshire Division, British Electricity House, St. Mary's Road, Leeds 7, to whom the completed forms should be returned within 10 days of the appearance of this advertisement. Envelopes to be endorsed "Power Station Superintendent—Huddersfield Power Station."

G. A. VOWLES,
Divisional Controller.
(M 131)

YORKSHIRE ELECTRICITY BOARD

APPLICATIONS are invited for the following appointments:—

No. 1 (Bradford) Sub-Area

SECOND ASSISTANT DISTRICT ENGINEER
(Bradford) (Vacancy No. 121/51)

Applicants should have technical qualifications equivalent to those required for Corporate Membership of the Institution of Electrical Engineers and have experience in the design, construction, maintenance and operation of heavily loaded industrial and urban networks working at voltages up to 33 kV. Experience of convertor and rectifier equipment and heavy direct current general supply and traction systems will be an advantage. The post may include participation in standby duties.

Salary: N.J.B. Agreement, Class "H," Grade 7, £692/£722 per annum.

Applications, stating the above vacancy number, and giving full details of age, qualifications, and experience, should be forwarded to the Manager, No. 1 (Bradford) Sub-Area, Yorkshire Electricity Board, 45-53 Sunbridge Road, Bradford, within fourteen days of the appearance of this advertisement.

No. 6 (Hull) Sub-Area

GENERAL ASSISTANT DISTRICT ENGINEER
(Bridlington) (Vacancy No. 121/51)

Applicants should have had experience in the operation and construction of 11 kV and l.t. overhead lines including pole mounted sub-stations for rural electrification. They should also be competent to carry out overhead line surveys, preparation of route plans, supervision of linesmen, and erection of overhead lines. Knowledge of underground networks will be an advantage.

Preference will be given to Corporate Members of the Institution of Electrical Engineers, or holders of the Higher National Certificate.

Salary: N.J.B. Agreement, Class "D," Grade 11, £436/£452 per annum.

GENERAL ASSISTANT DISTRICT ENGINEER
(Goole) (Vacancy No. 122/51)

Applicants should have had experience in the operation and construction of 11 kV and l.t. overhead lines including pole mounted sub-stations for rural electrification. They should also be competent to carry out overhead line surveys, preparation of route plans, supervision of linesmen and erection of overhead lines. Knowledge of underground networks will be an advantage.

Preference will be given to Corporate Members of the Institution of Electrical Engineers or holders of the Higher National Certificate.

The successful candidate will be required to reside in Selby and carry out standby duties.

Salary: N.J.B. Agreement, Class "D," Grade 11, £436/£452 per annum.

Applications, stating the above vacancy numbers, and giving full details of age, qualifications and experience, should be forwarded to the Manager, No. 6 (Hull) Sub-Area, Yorkshire Electricity Board, Ferensway, Hull, within fourteen days of the appearance of this advertisement.

(M 133)

BRITISH ELECTRICITY AUTHORITY

Midlands Division

APPLICATIONS are invited for the following positions in the Drawing Office of the Chief Generation Engineer (Construction) at Wolverhampton. Salaries will be dependent upon qualifications and experience within Schedule "D" of the National Joint Board Agreement, i.e., Senior Draughtsmen, Grades 4 (£600 to £700) and 5 (£500 to £600), and Draughtsmen, Grade 8 (£375 to £500):—

(a) Mechanical Engineering Section—SENIOR DRAUGHTSMEN, Grades 4 and 5, Draughtsmen, Grade 6;

(b) Civil Engineering Section—SENIOR DRAUGHTSMEN, Grades 4 and 5, Draughtsmen, Grade 6.

Applicants for (a) should have had experience in the layout and design of generating stations or generating plant, including boilers, turbo-alternators and ancillary equipment.

Applicants for (b) should have had experience in the layout and design of heavy structural steelwork, or in the layout and design of civil engineering and building works for generating stations, including reinforced concrete work.

Conditions of service will be in accordance with the National Joint Board Agreement, and superannuation under terms approved by the British Electricity Authority.

Forms of application may be obtained from the Establishments Officer, 53 Wake Green Road, Moseley, Birmingham 13, and should be returned not later than October 6, 1951.

F. W. LAWTON,
Divisional Controller.
(M 144)

BRITISH ELECTRICITY AUTHORITY

South Wales Division

Vacancy No. 94/51

APPLICATIONS are invited for the appointment of ASSISTANT ENGINEER (Combustion and Efficiency) at Llynfi Power Station, near Aberkenfig, at a salary in accordance with the revised National Joint Board Agreement, Class "G," Grade 9 (£571 to £597 per annum).

Applicants should preferably have obtained the Higher National Certificate and should have had experience in the operation of high pressure pulverised fuel boilers.

The appointment will be superannuable in accordance with the British Electricity Authority and Area Boards' Scheme.

Forms of application may be obtained from the Divisional Secretary at the address below, to whom completed forms should be returned not later than October 3, 1951.

H. V. PUGH,
Divisional Controller.

British Electricity Authority,
Cardiff (Pengam Moors) Airport,
Cardiff.
September 12, 1951. (M 150)

LONDON ELECTRICITY BOARD

DRAUGHTSMEN

APPLICATIONS are invited to fill several vacancies in the Drawing Office of the Western Sub-Area at Eccleston Place, Victoria, S.W.1, from candidates having the requisite training and experience for one or other of the following Sections:—

(a) Substations: Layout of switchgear, transformers and associated equipment for indoor type sub-stations up to 11 kV.

(b) Mains: Network planning, development and maintenance of cable route plans and operational diagrams at Sub-Area Headquarters or in individual Districts.

Training up to ordinary or Higher National Electrical standard and with workshop training preferred but not essential.

Pending grading of the posts under the National Agreement of the appropriate negotiating body, the commencing salaries will be as shown below:—

Engineering Draughtsmen: from £500 per annum inclusive;

Draughtsmen: from £400 per annum inclusive, dependent upon qualifications and experience.

Application forms, obtainable from Establishments Officer, 46 New Broad Street, E.C.2, to be returned, duly completed, within 10 days from the date of the appearance of this advertisement. Please enclose addressed foolscap envelope and quote ref. EST/V/1273/T on all correspondence. (M 145)

BRITISH ELECTRICITY AUTHORITY

East Midlands Division

APPLICATIONS are invited for the position of GENERAL ASSISTANT ENGINEER (Construction) in the Generation Construction Department.

The successful applicant will be required to act as Assistant to the Site Engineer at the Northampton Power Station.

Applicants must hold the Higher National Certificate in Electrical Engineering or be Graduate Members of the I.E.E., and should preferably have had workshop training.

Salary and conditions of service will be in accordance with the National Joint Board Schedule, Class "AX" (8), commencing at £437 per annum.

The post is superannuable within the provisions of the British Electricity Authority and Area Boards' Superannuation Scheme.

Forms of application, which may be obtained from the Divisional Establishments Officer, British Electricity Authority, British Electricity House, Barker Gate, Nottingham, should be returned not later than October 8, 1951.

L. F. JEFFREY,
Divisional Controller.
September 13, 1951 (M 148)

BOX No. replies to be addressed to the ELECTRICAL TIMES, Sardinia House, Sardinia Street, London W.C.2

BRITISH ELECTRICITY AUTHORITY

East Midlands Division

JUNIOR ENGINEER (LABORATORY)

APPLICATIONS are invited for the appointment of Junior Engineer (Laboratory) at Freemen's Meadow Generating Station, Leicester.

Duties consist of routine sampling and analysis of fuels, oils and waters, etc., and candidates should preferably have some laboratory experience.

The salary and conditions of service will be in accordance with the N.J.B. Agreement, Class "H," Grade 15, £412 per annum.

Applications should be submitted on the official form, which may be obtained from the Divisional Establishments Officer, British Electricity Authority, British Electricity House, Barker Gate, Nottingham, and should be returned not later than October 8, 1951.

L. F. JEFFREY,
Divisional Controller.

September 13, 1951. (M 147)

AIR MINISTRY require MECHANICAL and ELECTRICAL ENGINEERS for duty in their Works Department in connection with the design, operation and maintenance of ground mechanical and electrical works services on R.A.F. stations at home and overseas and on Civil Aviation stations. Appointments will be in two grades with a maximum of (1) £750 (D 19/48-A) or (2) £1,000 (D 370/50-A) respectively. Commencing salary will be in accordance with age, qualifications and experience. A special allowance of up to £800 a year is payable in addition to salary during overseas service. Candidates must be natural born British subjects. The minimum qualications and experience required for both grades of post are: (i) (a) University degree or equivalent diploma in electrical and/or mechanical engineering and have had at least a two year apprenticeship, or (b) Graduate or corporate membership of the Institution of Electrical Engineers, or of the Institution of Mechanical Engineers with appreciable electrical engineering experience, and have served at least a three-year apprenticeship; and (ii) have been employed in a responsible position for a minimum of three years with a well-established engineering concern, and there have gained wide experience in electrical and mechanical engineering practice.—Application forms from Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, W.C.2. Quoting D19/48-A or D370/50-A. Closing date October 12, 1951. (M 136)

APPLICATIONS invited are by the English Electric Co. Ltd. for vacancies for ENGINEERS to deal with all orders taken by the company for steel works installations and other metal industries projects. These comprehensive orders cover the whole field of electrical equipment, supply switchgear, rectifiers, rotating machinery, control gear and electronic apparatus. Applicants should be young men who have served a recognised relevant apprenticeship, and who have at least Higher National Certificate. The positions are permanent and progressive, and afford excellent opportunities.—Please write, giving full details and quoting Ref. 489A, to Central Personnel Services, English Electric Co. Ltd., 24-30 Gillingham Street, London S.W.1. (L 786)

APPLICATIONS invited for position with MANAGERIAL RESPONSIBILITY, in charge of inspection assembly and stores departments of small electrical component factory near Woking.—Please write, stating age and qualifications to Box No. 1049, Electrical Times. (M 125)

APPOINTMENTS OVERSEAS. The English Electric Company wishes to make a number of important appointments to their overseas organisation. Commercial experience and a good background of heavy electrical engineering are required. Previous overseas experience an advantage but not essential.—Applicants should write, giving full details and quoting Ref. 933, to Central Personnel Services, English Electric Company Ltd., 24-30 Gillingham Street, London S.W.1. (M 151)

ASSISTANT electrical maintenance PLANNING ENGINEER is required by the Steel Company of Wales Ltd., Abbey Works, Port Talbot. Candidates must have previous steel works experience in electrical engineering and should possess Higher National Certificate or equivalent.—Applications in writing, stating education, training and experience, should be submitted to: The Personnel Superintendent, The Steel Company of Wales Ltd., P.O. Box No. 3, Port Talbot. (M 153)

ASSISTANT SWITCHGEAR SALES ENGINEERS (inside) required to deal with inquiries and orders for power and substation switchgear. Good prospects for competent men.—Apply, giving details of qualifications and experience, to Personnel Manager, Ferguson Pailin, Ltd., Higher Openshaw, Manchester 11. (M 121)

DESIGN DRAUGHTSMAN required for interesting work on small mass-produced electro-mechanical devices. West London area.—Box No. 1053, Electrical Times. (M 154)

CHIEF DRAUGHTSMAN for electricity meter manufacturer, N.W. London, with knowledge and experience of precision mass production, staff control, material specifications, D.O./Works procedure. Good salary and prospects, staff pension. Give details education, training, experience and salary required.—Box No. 1045, Electrical Times. (M 118)

DRAUGHTSMEN. Vacancies exist on the permanent staff of Metropolitan-Vickers Electrical Co., Ltd., Trafford Park, for Draughtsmen with at least ten years experience in the design of light and medium gears, fabricated structures and electro-mechanical equipment. Must be capable of working without supervision.—Apply in writing, stating age, experience, qualifications, salary required, etc., marking envelopes "Electronic Control," to Personnel Manager, Metropolitan-Vickers Electrical Co., Ltd., Trafford Park, Manchester 17. (M 106)

EDITORIAL ASSISTANT, in a senior capacity, for electrical engineering journal. Engineering or Science Degree necessary, and also experience in sub-editing of high-class technical copy. Knowledge of foreign languages advantageous. Age approximately 30-35. Salary according to qualifications and experience.—Box No. 1047, Electrical Times. (M 119)

ELECTRICAL MAINTENANCE FOREMAN required for a paper mill in India with a 3,000 kW d.c. plant. Thoroughly practical man, experienced in distribution, motors and control gear up to 150 h.p. including simple automatics. Must be able to organise and supervise in detail planned routine maintenance, and run a self-contained repair shop, including re-winding. Lack of paper mill experience no handicap. Age limit 40. Salary, including Company's contribution to provident fund, dearness allowance and commission, equivalent to approximately £1,200 per annum. Free family passages, medical attention, furnished accommodation and servants. Four years contract.—Write to Box "G.Z.", c/o J. W. Vickers and Co. Ltd., 7/8 Great Winchester Street, London E.C.2. (M 71)

ELECTRONICS ENGINEER required for developments of special purpose electronic devices for use in a manufacturing concern. The main requirements are a good knowledge of circuits employing valves and photocells, and ability to devise circuits to suit particular purposes.—Reply, stating age, technical training, experience and salary required, Brentford district, to Box No. 1043, Electrical Times. (M 108)

ELECTRICAL wholesaler requires REPRESENTATIVES for Scotland and North of England. Must be car owners and have previous experience and connections.—Please write, stating age, experience and remuneration required, Box No. 1059, Electrical Times. (M 163)

ELECTRICAL wholesaler requires REPRESENTATIVES for Kent, Sussex, Surrey and Hants to take over existing connections and extend business. Applicants must be car owners, have previous experience and some connections in the area. Accommodation could be arranged after trial period. Salary, expenses and commission paid.—Please write in strict confidence, stating age, experience and references, Box No. 1061, Electrical Times. (M 164)

ENGINEER for cable contracts, London area. Duties to include estimating and carrying out contracts to final bill. A.S.E.E. salary and conditions.—Box No. 1057, Electrical Times. (M 161)

INFORMATION OFFICER (Assistant) required in the Research Laboratories of British Insulated Callender's Cables Ltd., at Shepherds Bush. Knowledge of electrical engineering is essential and some French or German and experience of U.D.C. would be desirable. An applicant in the age range 20 to 30 would be preferred.—Write, giving details of qualifications, experience, and salary required, to Staff Officer, British Insulated Callender's Cables Ltd., 21 Bloomsbury Street, W.C.1. (M 152)

MINISTRY of Fuel and Power. ELECTRICAL INSPECTOR OF MINES AND QUARRIES. The Civil Service Commissioners invite applications from men. The post is permanent and is in the provinces. Candidates must be at least 27 years of age on August 1, 1951, and must (a) hold a degree in Electrical Engineering, or have passed the examination for Associate Membership of the Institution of Electrical Engineers, or show evidence of suitable training as an electrical engineer; and (b) have had within the last five years at least two years' practical experience in the application of electricity to mining conditions. Inclusive London salary scale £750-£950. Rather less in the provinces. Starting pay is linked to age 30 with deduction of £25 for each year below 30 and addition of £25 for each year above 30 subject to a maximum of £800 at age 32 or over. These rates are at present under review. Prospects of promotion.—Further particulars and application forms from Secretary, Civil Service Commission, Scientific Branch, Trinidad House, Old Burlington Street, London W.1, quoting No. S4075/51. Completed application forms must be returned by October 25, 1951. (M 137)

MAINS ENGINEERS—The Calcutta Electric Supply Corporation, Ltd., invite applications from fully qualified Electrical Engineers for appointment to their Mains Department in Calcutta. Candidates must fulfil the following qualifications: (1) Age: Between 25 and 40 years. (2) Education: Graduate membership of the Institution of Electrical Engineers or candidates should have passed an examination equivalent to the Associate Membership Examination of that body. (3) Experience: Thorough working knowledge of modern overhead and underground distribution practice and experience in the erection and maintenance of overhead lines and underground h.t. and l.t. distribution networks. Preference will be given to candidates whose education and experience fit them for appointment as District Engineers after a short period of instruction in the Corporation's system in Calcutta. The appointments are permanent and selected candidates will be required to sign an agreement for three years. The monthly salary is in the grade Rs. 700-40-820 (Efficiency Bar), 900-45-1,035 (Efficiency Bar), 1,075-50-1,275 plus Overseas Pay, minimum Rs. 200 monthly, plus Overseas Marriage Allowance of Rs. 250 monthly (the present rupee exchange is 1s. 6d.). The starting salary in the above grade of selected candidates will be fixed by reference to their training, experience and fitness for appointment as District Engineers. There are in addition other generous allowances, including a Cost-of-Living Allowance. Free quarters are provided or a House Allowance in lieu thereof. There is also free medical attention and liberal leave and Passage Allowances. Contributory Provident Fund, etc. Applications, giving age, details of training, experience, present position held, should be addressed to The Secretary, Calcutta Electric Supply Corporation, Ltd., Victoria House, Vernon Place, Bloomsbury Square, London W.C.1. (M 74)

OPENINGS for two ELECTRICAL DRAUGHTSMEN between 40 and 50 years of age, West Midlands. Preferably experienced cranes and heavy steelworks plants, layouts and diagrams. Compulsory pension scheme, good canteen facilities, five-day week with some overtime. State age, present salary and give references.—Reply to: Chief Electrical Engineer, The Wellman, Smith, Owen Engineering Corporation Ltd., Darlaston, South Staffs. (M 165)

PERSONNEL experienced in the MAINTENANCE and REPAIR of ELECTRONIC CONTROL and RADAR EQUIPMENT are required for civilian appointments in North West, Midlands and South Wales. Salary £435 by £20 to £550 for Technical Assistants Grade III with opportunities for promotion to higher grades. Married accommodation may become available for selected personnel. Vacancies exist also for TELECOMMUNICATION and RADAR MECHANICS with general experience at £6 16s. per week, training facilities available.
Form of application from A.D.M.E., 4 A.A. Group, Peninsular Barracks, Warrington, Lancs. (M 120)

POWER STATION ENGINEER. Opportunity will shortly occur with British Managed Group of Power Stations in India for Senior M.I.M.E., M.I.E.E., or equivalent, experienced all branches power generation and distribution, in particular to be responsible for the running and maintenance of a group of thermal stations comprising B. and W. water tube boilers, turbo-alternators and auxiliary plant. Excellent remuneration and amenities will be offered to right man with probability of promotion to senior position at an early date. Age between 38 and 45. —Applications, in writing, to Box 5217, c/o Charles Barker and Sons Ltd., 31 Budge Row, London E.C.4. (M 124)

POWER STATION OR MARINE ENGINEERS.—Applications are invited by the Calcutta Electric Supply Corporation, Ltd., for appointment to the posts of SHIFT CHARGE ENGINEERS in Calcutta, where the company has three generating stations, each over 100 mW capacity. Candidates must either have had responsible operating experience in modern large high-pressure steam-generating stations or, alternatively, must have had marine experience with high-pressure water-tube boilers and turbines, and must hold a First-Class Board of Trade Engineering Certificate; such candidates without previous power-station experience would be required, if selected, to undergo a course of training in the U.K. before proceeding to Calcutta. The appointments are permanent and selected candidates will be required to sign an agreement for three years. The monthly salary is in the Grade Rs. 700-40-820 (E.B.), 900-45-1,035 (E.B.), 1,075-50-1,275, plus overseas pay minimum Rs. 200 monthly, plus overseas marriage allowance Rs. 250 monthly (the present rupee exchange is 1s. 6d.). The starting salary, in the above grade, of selected candidates will be fixed by reference to their training and operating experience. There are, in addition, other generous allowances, including overseas child allowance and cost-of-living allowance. In addition, free furnished quarters are provided, as is also free medical attention. Liberal leave and passage rules. Contributory provident fund, etc. Applications, giving age (about 35 to 40 preferred), details of training, experience, present position held, should be addressed to the Secretary, Calcutta Electric Supply Corporation, Ltd., Victoria House, Vernon Place, Bloomsbury Square, London W.C.1. (M 73)

PRODUCTION INSPECTORS required at a number of Admiralty Establishments and in shipbuilding and industrial centres in various parts of the country. The duties involve work in connection with the manufacture, inspection, test and installation of a wide variety of mechanical, electrical and electronic equipment for H.M. Ships. Candidates, who must be at least 25, should have served a recognisable engineering apprenticeship or have had equivalent training, followed by at least three years' relevant experience in industry or Government Service. They should preferably be in possession of Higher National Certificate or equivalent; a lower qualification, such as Ordinary National Certificate, might however, be considered. Ex-Service personnel with appropriate training and experience are eligible to apply. Appointments will be unestablished, but successful candidates will have opportunities at a later date of competing for permanent posts. The salary scale is £570 by £20 to £675 per annum, and entry will be at the minimum, subject to a deduction of £20 for each year by which the age at entry falls short of 30. Rates outside London are a little lower.—Write, quoting D.33/51-A, to the Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, London W.C.2, for application form. (M 155)

SALES ENGINEER. Firm in the Manchester area manufacturing high vacuum equipment, requires Sales Engineer. Good prospects for young man.—Apply in writing, stating age, experience, qualifications, salary required, etc., marking envelopes "Sales Engineer," to Box No. 1041, Electrical Times. (M 105)

SALES ESTIMATOR required, age 25/35, for Contracts Office of Laminated Plastic and Insulation Manufacturers. Electrical Engineering background preferred. Initiative and ability to conduct technical correspondence essential. Prospects of promotion. Pension Scheme.—Write full details of salary required to Box No. 1051, Electrical Times. (M 134)

SENIOR DRAUGHTSMAN urgently required for design and lay-out of automatic electrical control gear. Interesting work on high priority defence and export projects. Good pay, canteen facilities, and three-bedroomed, unfurnished self-contained flat available for successful applicant in near future.—Apply, in strictest confidence, to the Electro Dynamic Construction Co., Ltd., Control Gear Division, Bristol Road, Bridgwater, Somerset. (M 8)

SWITCHGEAR AND EQUIPMENT LTD. require the services of two young and energetic ENGINEERS for switchgear estimating and contracts, for London and Banbury. Should be up to H.N.C. standard. Good possibilities for future outside sales work.—Engineers interested should apply, in writing, stating salary required, to Reference WEB, Switchgear and Equipment Ltd., Southam Road, Banbury. (M 70)

TECHNICAL LABORATORY ASSISTANTS with experience in the fields of radio and electronics are required for work in the Stanmore area.—Apply in writing, giving full details of age, qualifications and experience, to the Staff Manager (Ref. GBI.C/G/821), Research Laboratories of the General Electric Company Limited, North Wembley, Middx. (M 45)

THE British Oxygen Co. Ltd. require for work at their head office, London, the services of an ELECTRIC DRAUGHTSMAN in possession of the following qualifications: (a) Technical: An ordinary National Certificate in Electrical Engineering or equivalent; (b) Experience: A minimum of 8 years experience in electrical installation work, including not less than 3 years D.O. experience. The duties of the successful applicant will be to prepare electrical layout and wiring diagrams for all types of electrical installations in the company's works and preference will be given to an applicant with suitable experience of flameproof installations.—Apply, giving full details of age, qualifications and experience, to Personnel Department, Bridgewater House, Cleveland Row, St. James's, London S.W.1. (M 123)

THE General Electric Co. Ltd., Witton, Birmingham, require an ENGINEER for production planning. Only qualified men, having a thorough knowledge of rotating electrical machinery up to the largest types, will be considered.—Applications, stating age, details of training and subsequent experience should be sent, quoting "Engineering Production" to Staff Manager. (M 122)

TRANSFORMER DRAUGHTSMAN required for South London factory on power transformers up to 3,000 kVA, 66 kV. Wide variety of work in good conditions, preference will be given to holders of Ordinary National Certificate or Higher National Certificate.—Box No. 9999, Electrical Times. (L 793)

TRANSFORMER TEST ENGINEER for factory in North London area. All sizes up to 500 kVA.—Apply, giving age, experience, salary required, to Box No. 1031, Electrical Times. (M 86)

WINDER, skilled a.c. and d.c., required by Thomas Wood and Son (Chester) Ltd., 38 Bridge Street, Chester. (M 156)

WELL-KNOWN Midland manufacturers of lighting equipment and engineering products require a full-time SENIOR SALES REPRESENTATIVE for London area and Home Counties. Applications should be made only by those who have an intimate knowledge of the trade and with first-class connections among wholesalers, contractors, etc.—Write, giving fullest particulars, past experience, age, etc., to Box No. 246, Dorland Advertising, Ltd., 18-20 Regent Street, S.W.1. (M 132)

APPOINTMENTS FILLED

UGANDA ELECTRICITY BOARD

THE Chairman of the Uganda Electricity Board wishes to thank all those who applied for the posts of ACCOUNTANCY ASSISTANTS in answer to the advertisement recently inserted in this paper. Over 100 applications were received and these are now being examined. Suitable candidates will shortly be invited to attend for an interview in London and they will be notified of the time and place by air mail letter from Uganda. (M 55)

APPOINTMENTS WANTED

ELECTRICAL AND MECHANICAL ENGINEER with administrative experience; corporate member, I.E.E. Development, D.O., manufacture; rotary machinery, switchgear, gearing and electronics. Adaptable.—Box No. 9109, Electrical Times. (L 774)

WORK WANTED

A.C. and d.c. Motor Rewinds and Repairs. Prompt service, fully guaranteed. Edgware 8631 (4 lines). —Service Electric Co., Ltd., Stanmore, Middx. (D 324)

CASTINGS, Fisher Foundries, Ltd., Greet, Birmingham, have capacity for brass, gun metal and soft grey iron machine moulded repetition castings weighing 1-30 lb. Loose pattern work up to 3 cwt. Delivery by road to all parts. Tel.: B'ham. Victoria 0197. (L 318)

METALWORK. All types cabinets, chassis, racks, etc., to your own specifications.—Philpott's Metalworks Ltd., Chapman Street, Loughborough. (L 601)

WANTED

A.C./D.C. MOTORS, STARTERS, complete change-over installation, etc.—A.A. Electrical Co., Ltd., 67 Rothschild Road, Chiswick Park, W.4. Tel.: Chiswick 5105. (A 20)

DIESEL-ELECTRIC GENERATING SETS urgently required. 50 to 500 KVA and good class Diesel Power Plants of all kinds. Prompt inspection and good price offered.—F. J. Edwards Ltd., 359 Euston Road, London N.W.1. Tel.: Euston 4681 or 41 Water Street, Birmingham 3. Tel.: Central 7606. (M 126)

ELECTRICAL STEEL OFFCUTS required. Small and large quantities from between ·016 in. to ·025 in. in 2 ft lengths or upwards, but not less than 3 in. in width. Prompt payments.—Box No. 1063, Electrical Times. (M 167)

ELECTRICAL STEEL OFFCUTS required, minimum widths 3 in. x ·016 in. thick; any quantity up to 10 tons. —Write, Box No. 1033, Electrical Times. (M 88)

WANTED, ROTARY CONVERTORS, any size.—Universal, 221 City Road, London E.C.1. (A 16)

WANTED for prompt cash, ferrous and non-ferrous SCRAP; also plant for dismantling. Buyers of second-hand machinery and plant for re-use.—W. and H. Cooper, Ltd., 176 Brady Street, Bethnal Green, E.1. (A 1)

WANTED. Large quantity of 4-in. outside diameter TUBES from the dismantling of old Babcock Water-tube Boilers. Best prices paid. Prepared to purchase Babcock and Wilcox Water-tube Boilers for dismantling. —Apply, giving full details to Midland Iron and Hardware Co., Cradley Heath.

WANTED. D.C. and A.C. ball-bearing MOTORS, MOTOR GENERATOR SETS, DYNAMOS and ALTERNATORS.—Full details to Britannia Manufacturing Co., Ltd., 22-26 Britannia Walk, London N.1. (A 13)

AGENCIES

MANUFACTURER of street lighting equipment and wide range of electric cooker accessories requires REPRESENTATIVES or AGENTS with first-class connections with British electricity authorities to cover the whole of England, Wales and Scotland.—Write, giving full particulars and area covered to Box No. 1021, Electrical Times. (M 63)

FOR SALE

CABLES & WIRE

EARTH-CONTINUITY. Use the PORTAWAY EARTHING CONDUCTOR with the Fulgrip-Portaway bonding clamp for the most efficient earthing system. Send for new leaflet today: Porter Electrical Products Ltd., Bramhope, Leeds. Tel. 73428. (L 788)

P.I.L.C. CABLES, ·0225 to ·5 available from stock. —Boyce, Weir and Co., 778 New Hey Road, Huddersfield. (M 81)

TINNED STEEL ARMATURE BINDING WIRE. All sizes from 14 s.w.g. to 30 s.w.g. supplied in coil or on reels.—Frederick Smith and Co., Wire Manufacturers Ltd., Caledonia Works, Halifax. (G 381)

DOMESTIC APPLIANCES

IMMERSION HEATERS, Grubb 4 kW. No purchase tax. All lengths, 16 in. to 36 in. Standard voltages. Provision for intermediate loadings. Fully guaranteed. Write for illustrated brochure, latest lists and traders terms to distributors.—John Owner and Co. Ltd., Springfield Road, Birmingham 13. Tel.: Spr. 2939. (C 392)

"MORAHEAT" 4 kW IMMERSION HEATERS with Satchwell thermostatic control, 16 in. to 42 in. Fully guaranteed, reliable, competitive, good deliveries. —Apply: Agent, W. Tyler, 20 Finnemore Road, Little Bromwich, Birmingham. (M 166)

GENERATING PLANT

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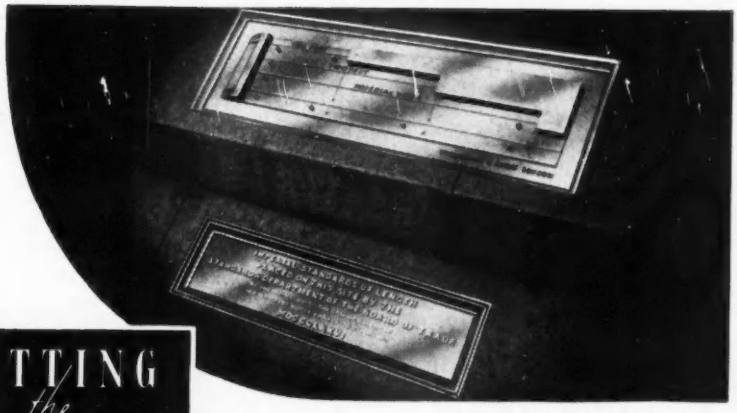

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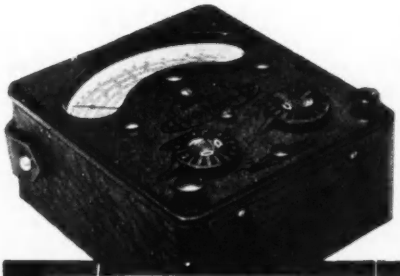

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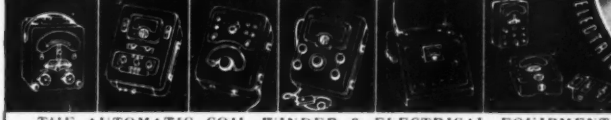

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INDEX TO ADVERTISERS

Aerialite, Ltd. 83
Automatic Coil Winder & Electrical Equipment Co., Ltd. ... 65
Beetle Products Co., Ltd. ... 29
Belling & Co., Ltd. 6
Belmos Co., Ltd. 25
Bill Switchgear, Ltd. 5
Britannia Batteries, Ltd. ... 22
British Electric Meters, Ltd. ... 7
British Electric Resistance Co., Ltd. 26
British Insulated Callender's Cables, Ltd. 1, 46
British Power Transformer Co., Ltd. 68
British Thomson-Houston Co., Ltd. 79
Carter, B. & F., & Co., Ltd. ... 80
Chamberlain & Hookham, Ltd. ... 36
Chloride Batteries, Ltd. ... 71
Clang, Ltd. 76
Cole, E. K., Ltd. 38
Contactor Switchgear, Ltd. ... 9
Courtney Pope (Electrical) Ltd. ... 26
Cressall Mfg. Co., Ltd. 4
Critchley Brothers, Ltd. ... 80
C. & G. S Trading Co. ... 68
Daly (Condensers) Ltd. 14
Drake & Gorham Wholesale, Ltd. 72
Edison Swan Electric Co., Ltd. 45
Electric Construction Co., Ltd. ... 41
Electropower Gears, Ltd. ... 78
Elliott Brothers (London), Ltd. ... 28
Engineering & Lighting Equipment Co., Ltd. 24
English Electric Co., Ltd. 33, 75
Erskine, Heap & Co., Ltd. ... 12
Ferranti, Ltd. 51
Ferranti, Denis, Co., Ltd. ... 84
Ford, A. C., Ltd. 4
Fry's Metal Foundries, Ltd. ... 52
Geipel, William, Ltd. 80
General Cable Manufacturing Co., Ltd. 34
General Electric Co., Ltd. 27, 77
Genristo, Ltd. 14
Griffiths, Gilbart, Lloyd & Co., Ltd. 47
Grubb Engineering Co., Ltd. ... 38
G.W.B. Electric Furnaces, Ltd. ... 8
Hackbridge & Hewittic Electric Co., Ltd. 55
Hart Accumulator Co., Ltd. ... 66
Heaths (Eccles) Ltd. 72
Heatrae Ltd. 67
Henley's W.T. Telegraph Works Co., Ltd. 43
Hoover, Ltd. 54
Hotpoint Electric Appliance Co., Ltd. 82
Igranic Electric Co., Ltd. ... 21
Ingram Kemp & Joyner 44
International Combustion, Ltd. ... 35
Johnson & Phillips, Ltd. 2
Kempston Electrical Co., Ltd. ... 78
Lancashire Dynamo & Crypto (Mfg.) Ltd. 23
Laurence, Scott & Electromotors, Ltd. 3
Legg (Industries) Ltd. 70
Lewis Spring Co., Ltd. 76
Lindley Thompson Transformer and Service Co., Ltd. 49
Low, Duncan, Ltd. 80
Measuring Instruments (Pullin) Ltd. 48
Metropolitan-Vickers Electrical Co., Ltd. 15, 56
Metway Electrical Industries, Ltd. 30
M K. Electric, Ltd. 47
Moss, William, & Sons, Ltd. ... 78
Nevelin Electric Co. Ltd. ... 84
Parmiter, Hope & Sugden, Ltd. ... 10
Partridge, Wilson & Co., Ltd. ... 8
Permaheat, Ltd. 74
Philips Electrical, Ltd. 32
Premier Cooler & Engineering Co., Ltd. 72
Renfrew Foundries, Ltd. ... 39
Revo Electric Co., Ltd. 69
Reyrolle, A. & Co., Ltd. ... 31
Rotunda, Ltd. 44
Runbaken, Ltd. 78
Sanders, William & Co. (Wednesbury) Ltd. 81
Service Electric Co., Ltd. ... 64
Shell Mex & B.P., Ltd. 19
Siemens Electric Lamps & Supplies, Ltd. 42
Simplex Electric Co., Ltd. ... 50
Sloan Electrical Co., Ltd. ... 70
Standard Telephones & Cables, Ltd. 11
Statter, J. G. & Co., Ltd. ... 76
Steatite & Porcelain Products, Ltd. 16
Stewarts & Lloyds, Ltd. 20
Stirling Boiler Co., Ltd. 13
Sturdy Electric Co., Ltd. ... 76
Sunvic Controls, Ltd. 30
Thorn Electrical Industries, Ltd. 73
Tilling-Stevens, Ltd. 74
Tucker, J. H., & Co., Ltd. ... 18
U.S. Metallic Packing Co., Ltd. ... 30
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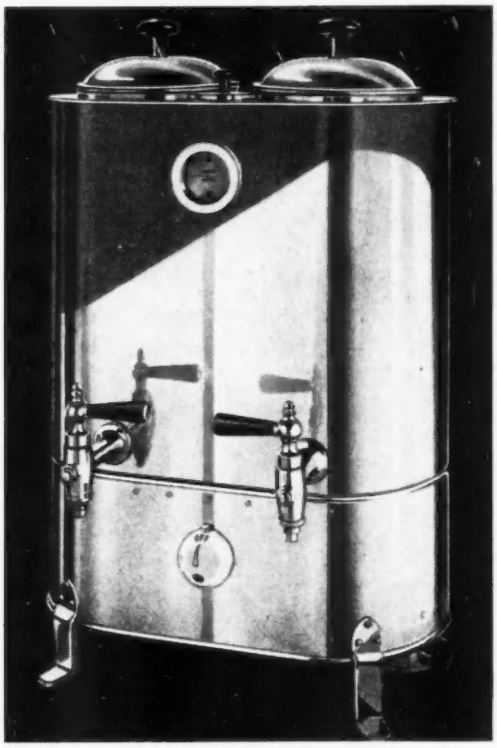

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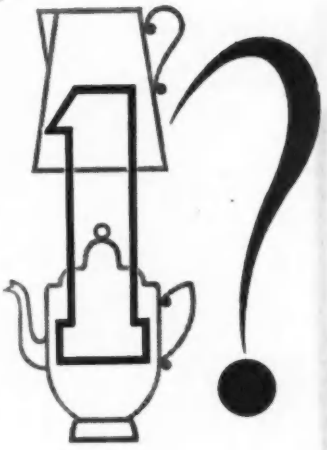

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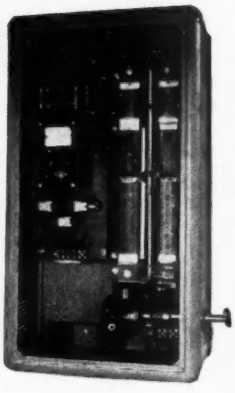

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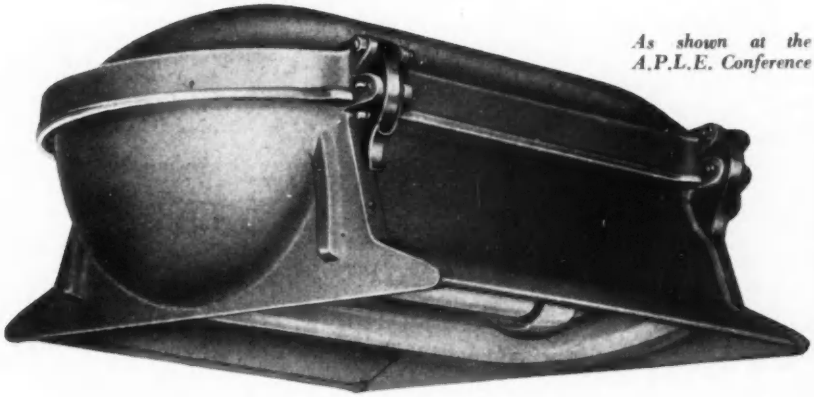

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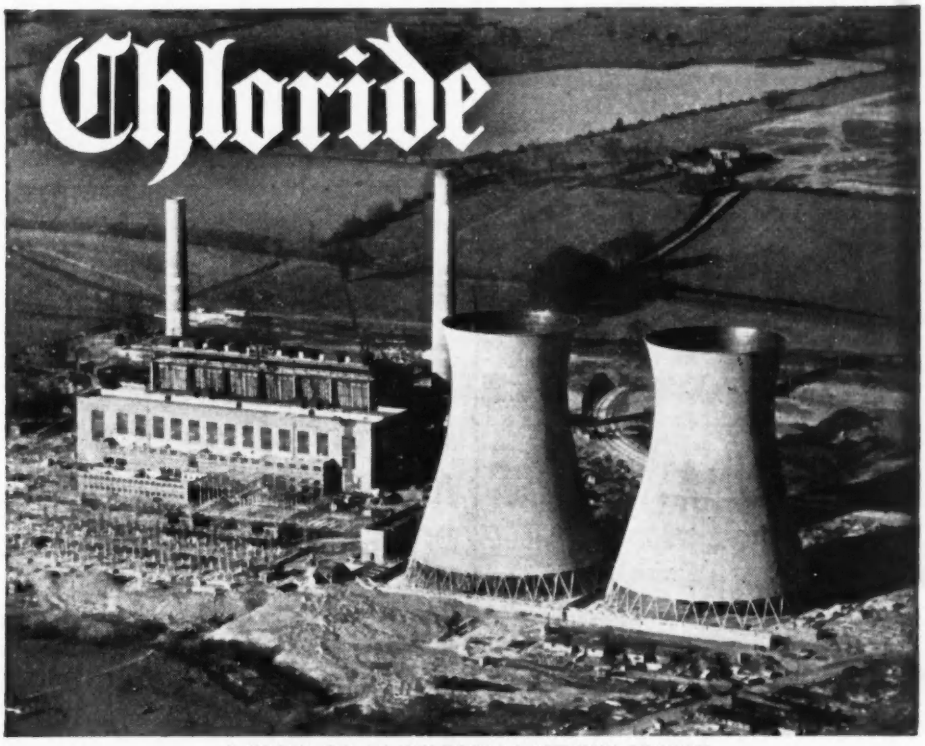

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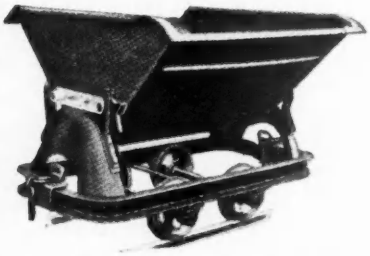

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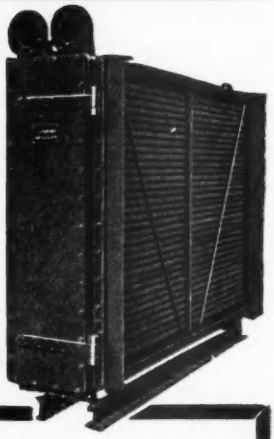

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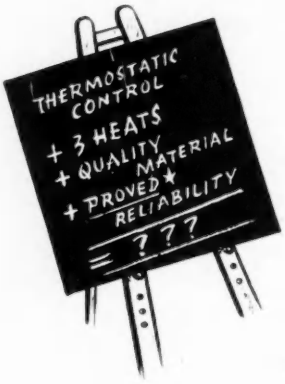

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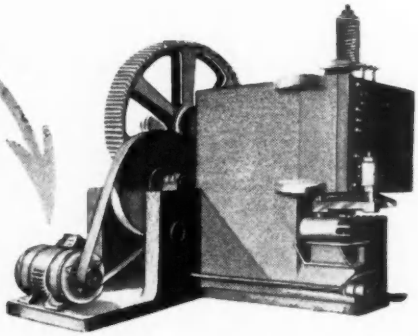

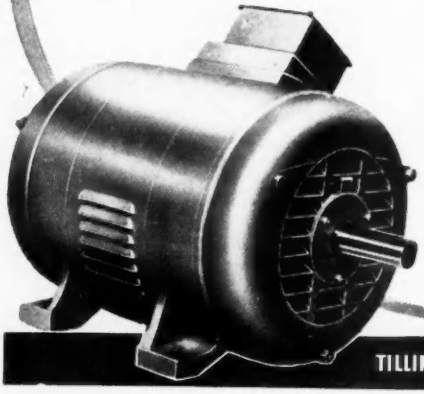

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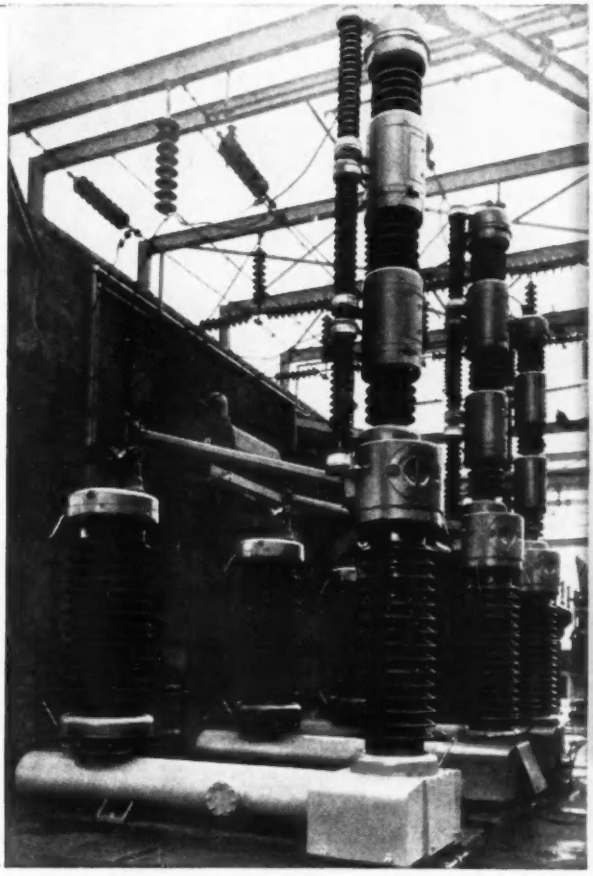

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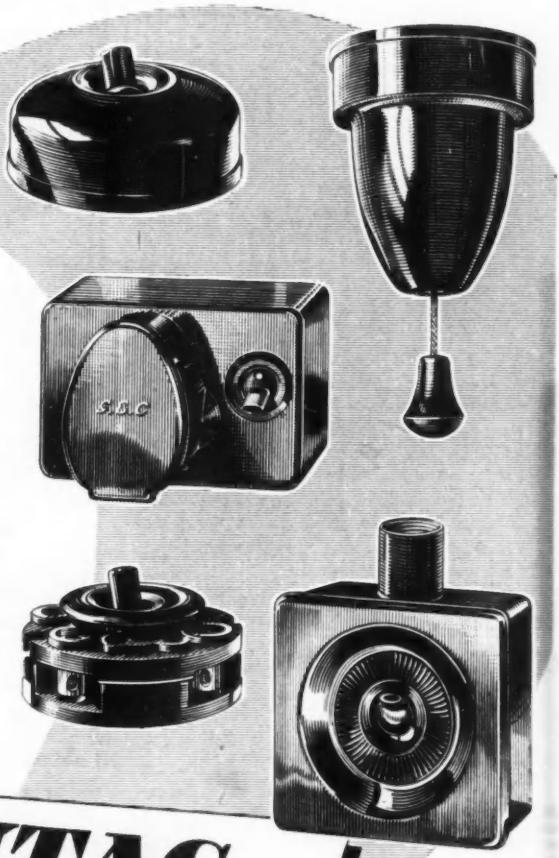

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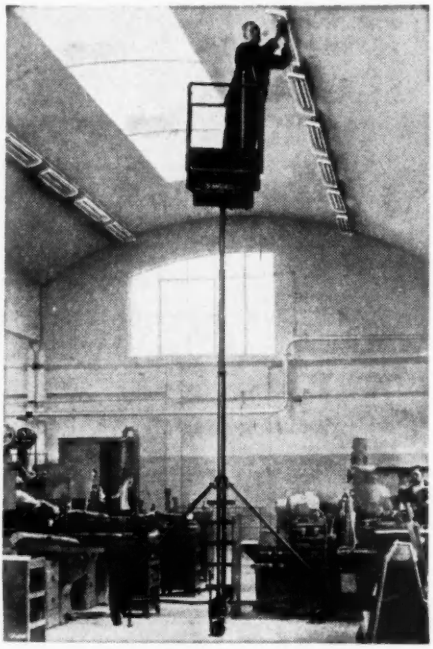

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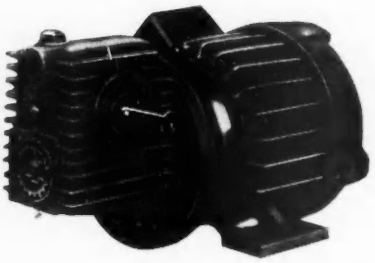

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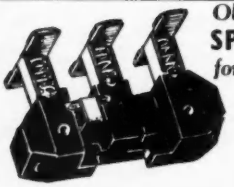

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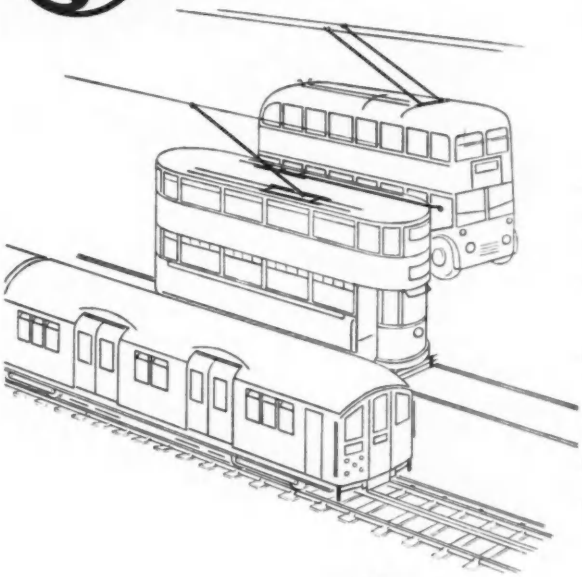

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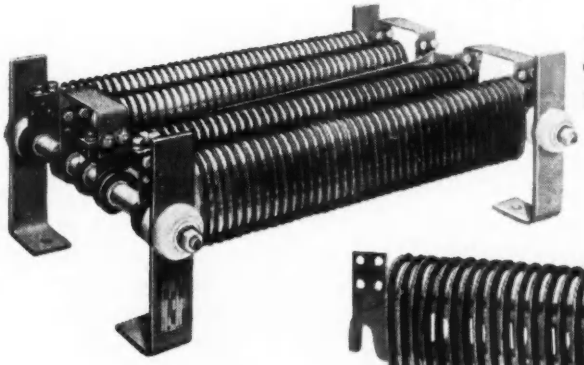

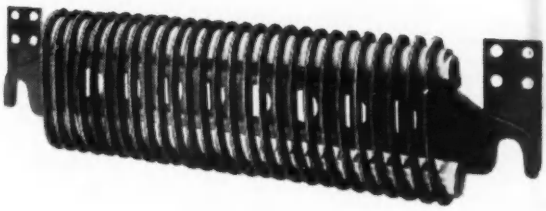

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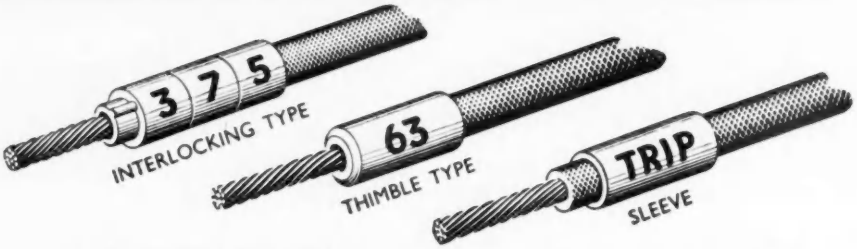

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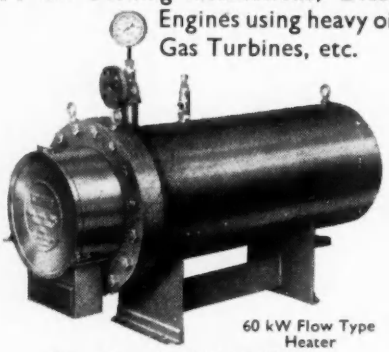

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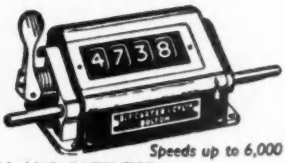

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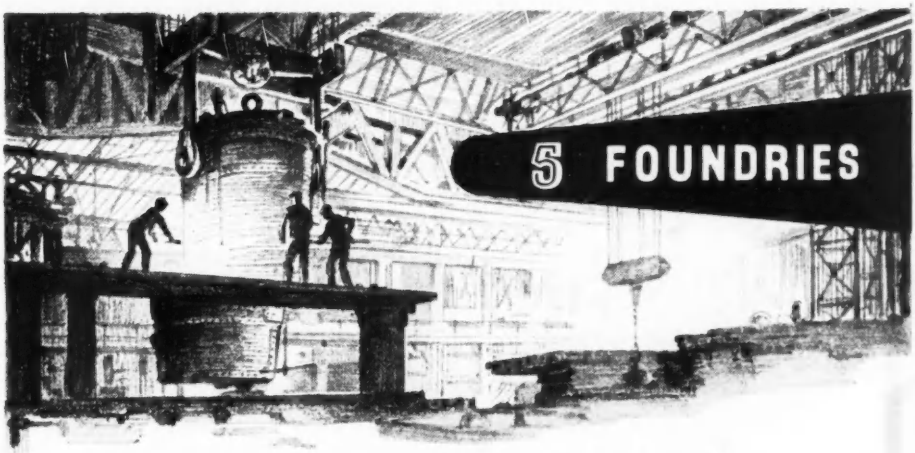

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